THE

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1906—No. 7.

[REPRINT FROM THE BENGAL BULLETIN No 8 OF 1905.]

AGAVE AND FURCRAEA SPP.

..ARY OF ECONOMIC PRODUCTS, Vol. I., A. 602-638; Vol. III., F. 740

..TES ON AGAVE AND FURCRAEA IN INDIA

BY J. R. DRUMMOND AND D. PRAIN



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CALCUTTA
OFFICE OF THE SUPERINTENDENT GOVERNMENT PRINTING, INDIA
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NOTES ON AGAVE AND FURCRÆA IN INDIA

[*Dictionary of Economic Products, Vol I, A 602 638, Vol III, F. 749*]

BY J R DRUMMOND AND D PRAIN



INTRODUCTORY

WHAT is often called "Aloe fibre" collectively is obtained in India from different plants assigned to the genera— INTRODUCTORY

(1) Sansevieria *Nat ord* Hæmodoraceæ
(2) Agave „ Amaryllideæ
(3) Furcræa „ Ditto

Sansevieria yields "Bowstring Hemp" and is dealt with in *Kew Bulletin 4, April 1887*, to which nothing need be added here except that one or more *Sansevierias* appear to have meantime come into commercial use in India

The object of this paper is to clear up so far as possible certain questions of botanical identity with regard to those forms of (2) and (3) that are domesticated in this country, and we have accordingly dealt with their history in some detail in another part of the paper For those who may care to know our conclusions without following all the steps that have led up to them, the first part will, we hope, be found useful, though it necessarily anticipates a good deal that is more fully discussed in the second

PART I—DESCRIPTIVE

THE first part includes—

(*a*) a brief general description of the genera Agave and Furcræa, limited however as regards the former to the section *Euagave*,
(*b*) a description of those* species which are naturalized in India, or cultivated for their fibre, with a key to the species of *Euagave*,
(*c*) remarks on certain of the species known in India.

* Also of one species which is neither naturalized nor grown for fibre, viz., the "*False Sisal*"

NOTES ON AGAVE AND FURCRÆA IN INDIA

[*Dictionary of Economic Products, Vol. I, A 602 638, Vol. III, F. 749*]

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AGAVE GENERAL DESCRIPTION OF EUAGAVE AND FURCRÆA

Place in Classification of Plants

We have followed Bentham and Hooker in regarding Agave and Furcræa as belonging to the Amaryllideæ, but *whether this arrangement be adopted or not*, Agave and Furcræa with a few minor genera form a natural tribe which may conveniently be styled the "Agaveæ" It has been proposed to include the "Yuccas" with this, and to elevate Agaveæ to the rank of a Natural Order The objection that this would include types with the ovary "superior" as well as those with it "inferior" is not very weighty (*cf Engelmann's Collected Works, Cambridge Mass 1887, p 301*)

General Description of Flowers

Both in Agave and Furcræa the perianth is divided into six usually uniform segments, in Furcræa these are separated for their whole length but in Agave the "germen" (containing the ovary) is continuous with a cup which surrounds the base of the style and gives rise to the stamens, usually —*though not always—at the same level as the free lobes of* the perianth, which vary in outline from ovate-lanceolate to narrowly ligulate In Furcræa the flower is more or less bell-shaped, and the segments broadly ovate, while the stamens often have their stalks dilated and are not inserted on the cup of the perianth but upon a ring which embraces the conical pistil Moreover the stamens in Agave are doubled back within the bud springing up elastically when the bud opens The anthers of Agave—which, though absolutely large, are small in proportion to the size of the plant when compared with those of Crinum, or Lilium, for example or of some Gramineæ—are versatile In Furcræa the stalk of the stamens (filament) is stouter and shorter than in Agave, and the anthers, which are usually attached by their backs to the filament, do not overtop the perianth The style in most *Euagaves* is at first shorter than the stamens, but elongates gradually until it overtops them, after which they shrivel up with the limb of the perianth segments, but remain attached for some time to the maturing "pod" or capsule In A. Wightii (*A tuppara* of Wight) the bases of the perianth lobes change in texture, as the ovules ripen, and remain as a beak to the capsule *

* *Engelmann* (*l c p 304*) was led to suppose that the flower in *Agave* is vespertine or nocturnal This was due to his having studied *A virginica Linn* only, a peculiar type which should probably be placed in a separate genus *The*

The blossoms (in **Euagave**) are arranged in clusters* on the ultimate offshoots of a compound inflorescence, which consists of a series of main branches given off spirally from the main flowering stem or scape, which attains (*e g*, in **A. Vera Cruz**, *Miller*) a height of thirty-five feet including the panicle The scape is furnished with scarious bracts, and there are similar but smaller bracts at the origin of the subsidiary branches The blossoms in **Furcræa** are arranged in rows (with a bract to each blossom) along the secondary branches of the panicle The arrangement of the main and ultimate branches varies considerably, but is constant and often characteristic for particular species In all, however, it conforms more or less closely to the well known "candelabrum" structure

AGAVE

General Description of Inflorescence

The leaves of *Euagaves* are very fleshy, usually ensiform, with a thick base which clasps the trunk by a dilated margin · above this the leaf is more or less narrowed or constricted, and then broadens upwards to the middle or above it, when it tapers to the point which merges in a cartilaginous prolongation of the leaf margins or is capped by a stiff sharp horny spine which appears to originate in twisted strands of the internal fibres In **Furcræa** there is seldom even a vestige of a terminal spine, and the tip, though usually involute for about an inch or less, is not ordinarily cartilaginous

of Leaves

The margins of the leaf are beset at varying intervals with spines or prickles, differing in structure in the different species, but usually consisting of a thin sharp more or less transparent thorn arising from a broader opaque cushion which is formed presumably from the thickened epidermis of the leaf margin The substance of the leaf is always more or less fleshy, consisting of large loosely compacted cellular tissue traversed lengthwise by a series of vascular bundles which constitutes the "fibre" *The structure of these bundles and their direction* vary with the species, but in all they appear to arch or interlace

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In [Eu]*agaves* are more or less proterandrous as a rule, but are neither fragrant nor nocturnal

the lateral bud is perhaps analogous to a trunk-offset.

AGAVE
General Description of Leaves

to some extent towards the margins The cellular tissue is replete, in most specie, with mucilage* and different salts, it takes up and stores water in great quantity, and gives out under certain conditions a sweet sap or mead (as in the case of the "Pulque"-producing species) A nectar is secreted also by the flowers of most of the *Euagaves*

The skin of the leaves is so arranged as to check transpiration (*Miss Bot. Gard Rep VII, p 52*) True hairs are altogether absent Certain Furcræas have the cuticle of the under surface of the leaf equipped with minute tubercles, making the surface to the touch like sandpaper

The leaves are arranged on the trunk or "*caudex*" in a more or less regular spiral, when the spiral is dense, a marked "*rosette*" is formed (as in "**A vivipara") in other species again such as A sisalana, the leaves have the appearance of being tufted † The angle formed by the leaf with the main axis varies greatly as between species in the same species it is almost mathematically constant

Frequency of Flowers

All Agaves were formerly supposed to require long periods before attaining maturity, and to perish after flowering, but experience has shewn that several species are truly *polycarpic*. As a rule, however, the *Euagaves* are *monocarpic* (Cf *Watson in Gard Chron 1 1897 pp 166–167*)

Not always once in the plant's life

A. americana *Linn* is the most variable as regards the period of flowering, but the recorded instances of prolonged dormancy are due probably to the specimens being cultivated in the north of Europe

A Vera Cruz *Miller* appears to "pole' in South Spain after six years on an average, or on the Adriatic after twelve or fourteen, in a naturalized condition In North India most of the Agaves (except A americana, *Linn*) seem to pole from their fifth to their seventh year, but if that be passed without flowering then not till the twelfth or fourteenth

The Yucatan Indians are said to have a secret by which they can tell when the "Sacqui" (a species near to "sisalana") is about to pole, and by cutting off the bud poling is retarded in the interests of the planter

* *Saponin* is said by several writers to be present in the leaves and roots but recent chemical analysis is reported not to have confirmed this

† Forming a *coma'* ** *see* our A. Wightii

AGAVE

Formation of Suckers

When a shoot has blossomed then in ordinary course it dies, but the trunk may give off living offsets, or new buds may form In certain species, notably in A. Vera-Cruz and A sisalana, the suckers often flower along with the parent.

Poling is accelerated, and may be produced, by injury, by sharp cold, transplantation, or any other sudden change in the condition of the individual At Algiers in 1830 the French had occasion to clear for military purposes a piece of ground that was much overgrown with Agave and the soldiers were encouraged to destroy the plants, which during 1830 31 they did by hacking the leaves and slicing off the cone of inner leaves by way of sabre practice In 1832 the whole plain was covered with the bloom of some 1,500 Agaves (*Bull Soc. Bot de France IX, p 176*) The effect of checks to the vegetative system in developing floration are familiar (an every day example is afforded by the pruning back of roses), but for most purposes it may be assumed that any of the Indian Agaveæ (including ' sisalana") may flower by its seventh year or even earlier

Colour of Flower

The flowers of all the *Euagaves* are partly "herbaceous," *i e*, they retain to some extent the special texture and colouring of the vegetative parts, as distinguished from those of a normal perianth Those parts of the flower (except the pollen) that do not thus lean to the vegetative type are generally of a more or less transparent amber In A sisalana, and perhaps in other species, the filaments are delicately banded ("fasciated') with a faint pink The ripe pollen is invariably orange yellow, though the intensity varies with the species and in the same species with the stage of development There seems little reason to doubt that Euagave and Furcræa are wholly anemophilous *Miss Mulford (Miss ouri Bot Gdn Rep VII above quoted)* evidently thinks that the high scape and honeyed blossoms serve to attract small birds and large insects Doubtless they do, and the aid given by this means is through the shaking of the flower or branches Hybridization under artificial conditions is reported With the larger species in a state of nature we should think it is of very rare occurrence

Wind fertilised.

Production of Bulbils

All or nearly all the Euagaves are proliferous, *i e*, instead of all the flowers producing ripe seed-bearing capsules a certain number develop buds direct without seeding, which

AGAVE

General Description of Leaves

to some extent towards the margins The cellular tissue is replete, in most species, with mucilage* and different salts, it takes up and stores water in great quantity, and gives out under certain conditions a sweet sap or mead (as in the case of the "Pulque" producing species) A nectar is secreted also by the flowers of most of the *Euagaves*

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† Forming a ' *coma* ' ** *i e* our **A Wightii.**

AGAVE
Key to Indian Species

DESCRIPTION OF SPECIES.

KEY

eaves in section flat to concave but never channelled throughout :—

Teeth minute, close set . Species *A* ———

Teeth larger, more or less remote —

Leaves in a lax rosette or tufted never less than 3 feet in length :—

Perianth segments not constricted towards the tip :—

Leaves broadest in the middle tapering to both extremities :—

Leaves oblong lanceolate neck sharply constricted Species *B* (americana, Linn)

Leaves linear oblong neck not constricted —

Marginal prickles pointing uniformly downwards leaf flattish throughout Species *D* (Vera Cruz, Miller)

Marginal prickles of upper part of leaf pointing upwards leaf deeply trough shaped in upper fourth Species *C* ———

Leaves hardly widened in the middle very narrow in proportion to their length :—

Leaves linear lanceolate curving outwards throughout their length, terminal spine acicular Species *E* (Cantala, Roxb.)

Leaves narrowly oblong, not curving, stiff, erect terminal spine conical from a stout base Species *F* ———

Perianth segments narrowed from about the middle to the ligulate tip :—

Leaves straight . . Species *G* (sisalana Perrine)

Leaves drooping from their upper third or less . Species *H* ———

Leaves in a close globose rosette never exceeding 3 feet in length Species *I* (Wightii, nobis)

Leaves in section canaliculate . . . . Species *K* (decipiens, Baker

AGAVE

Species A described

Agave sp. . . . . . *A*

Leaves linear oblong 20–30 in a very lax *rosette* from a moderately thickened base, deep green with a glaucous bloom, tapering rather quickly in the upper portion, about 5 feet in length and as many inches in breadth at the widest part rather above the middle, marginal prickles minute but sharp, when young garnet-coloured, pointing both upwards and downwards, sometimes absent in *the upper portions of the* leaf altogether, terminal spine brown subulate, slightly channelled

INDO CHINA Burma Tenasserim

DISTRIB Unknown

This we suppose to be the same as a plant cultivated in the Saharanpur *Bot Garden under the erroneous name of* "*A Ixtli*"

AGAVE AMERICANA described. A Garden Aloe of India

Agave americana *Linn* . . *B*

Leaves lanceolate, many in a lax rosette from a short stout prostrate or ascending trunk which is usually hidden by their thick bases, deep green, often variegated with white or pale yellow longitudinal stripes or borders, sometimes rather glaucous at base spreading then ascending tips sometimes recurved, 4 to 6 ft long and as much as half a *foot broad* above the middle, sharply constricted just above the base margins armed with strong dark brown prickles mostly pointing downwards, *leaf* edge between the prickles *concavely indented*, terminal spine slightly grooved dull brown 1 to 2 in long derived from the upper leaf margins which for about three inches *from* the *top* are involute and horny, scape with the panicle 15 to 25 ft in height, primary branches of the inflorescence almost horizontal, fascicles of blossoms crowded at the ends of subsidiary ascending branches, germen faintly sulcate about equalling the perianth or shorter than it perianth lobes ovate lanceolate tips obtuse, amber-coloured as are also the filaments, pollen orange yellow, style faintly three lobed capitate, capsule bluntly trigonous or oblong cylindrical, rather broader upwards

Linn Sp Pl (Ed 1) t 323, Kunth, Enum V 819, Thornton, New Illustr aft p 100 (also col fig in Select Plants), Andr. Bot Rep iii t 433 (sphalmate 438),

Bot Mag t 3654, Nees, Gen Fl Germ Monocot Vol iii tab. sec , Reichenb Fl Germ ix t 374 AGAVE AMERICANA described

INDIA Large gardens and parks throughout India

DISTRIB Gardens throughout Northern Europe and North America Native country unknown

The plant, widely naturalized and commonly termed *Agave americana* in Southern Europe, we believe to be A. Vera-Cruz *Miller* The remarks under *A americana* in *Linnaeus' Species Plantarum* cover both the true A americana and *Miller's* A Vera Cruz

A Milleri, *Mart Flor Bras iii* 1 183 appears to be this species *A americana, Mart nec Linn*, appears as regards description and synonymy to refer for the most part to A Vera Cruz *Miller.* The description of *A americana* by *Mr. Baker* in *Gardener's Chronicle* N S vii 201 (1877) gives an excellent account of A. americana *Linn* but the remarks apply in part to A Vera Cruz *Miller* The Peruvian plant named *A americana* by *Ruiz* and *Pavon* is perhaps different from either

Agave sp . . . *C* AGAVE Species C described

Leaves oblong-linear many from a very thick short caudex which is hidden by their greatly thickened bases, dark green, glaucous, spreading from the stem but presently ascending, tips recurved stiffly, blade six feet long and upwards, measuring eight to twelve inches at the widest part some way above the middle and there forming a deep trough through bending of the leaf and rolling inwards of the margins, prickles very stout and black, those above the trough like portion of the leaf spreading or ascending the rest pointing downwards, terminal spine about ¾ in long dark coloured [Inflorescence not available]

INDIA: cultivated in the Botanic Garden, Saharanpur received from Europe

DISTRICT Native country unknown

This seems closely allied to Agave Vera Cruz *Miller.* It is known at Saharanpur as *A Jacquiniana*, but it certainly is not the plant figured under that name in *Bot Mag.* t. 5097 The leaves of this species when fresh cut smell like cut Rhubarb stalks, and their juice soon ferments

AGAVE VERA-CRUZ described

The Common Grey Aloe of India

Agave Vera-Cruz . . . . D

Leaves linear-oblong, many, from a short stout trunk which is hidden by their thickened bases, sage green often very glaucous, early curving upwards, the ends usually more or less recurved or drooping, four to six feet long, often rather concave at the widest part which is above the middle and attains a breadth of ten inches and upwards, neck hardly constricted, leaf margins little indented or nearly straight between the prickles, which are broad stout, black or dark-coloured, spreading or decurved, interval between the prickles about half an inch or less, seldom ¾ in ; terminal spine shortly channelled, ½—1 in. long, dark brown, not or very shortly decurrent; inflorescence panicled, trichotomous as regards the main branches which are curved and flattened, blossoms in pairs with a subsidiary bud laterally developed at a different level, germen smooth cylindric longer than the perianth, perianth-lobes linear-lanceolate of a pale amber tint, cup herbaceous, stamens much exserted, anthers half an inch in length and upwards, pollen dull-yellow, style very faintly lobed, capsule rather turgid oblong-cylindrical, tip rounded, seeds black shining. *Miller, Gard Dict. ed. 8. n 7.*

Agave lurida, *Zuccarini in Nov. Act. Leop. Carol. xvi. 2. 670, tt. 49, 50; Mart Flor. Bras. iii. I, 185; Bak. in Gard. Chron N S viii 264 (1877)* excl var *Jacquiniana* and ref.; not of *Jacquin Coll. iv 94, t I*; nor of *Gawler Bot. Mag. 1522* Agave Vera Crucis *Haw. Syn Succ 72.*

INDO CHINA Burma, Taungtha, *Burkill* 23,777! and other localities in dry Central Burma, *Burkill* Assam, Cachar, *Burkill* 16260! Brahmaputra Valley, frequent, *Burkill* 19958!

INDIA Bengal, Katihar, *Burkill* 20871! Gangetic delta, frequent, Botanic Garden, Shibpur, cultivated. Upper Gangetic Plain, from Tirhoot (in hedges) to Rohtak (S E. Panjab), *Burkill* 18173, but usually planted, cultivated in Botanic Gardens as far as Lahore Chota Nagpur, Singhbhum, *Burkill* 19759! Central India, Bilaspur Western India, Bombay, cultivated *Burkill* 16692! 16686! Deccan, Miraj, *Burkill* 16712! South India, Bellary, *Burkill*, Chingleput, *Barber* 2401! Guntur, *Barber* 2042, 2085, Chingleput, *Barber* 2080, Kurnool *Barber* 2041, 2068, Salem, *Barber* 2070, Kistna, *Barber* 2501, Coimbatore, *Barber*, 2502, Madura *Barber*, 2503, 2505, Anantapur *Barber* 2513, S Arcot, *Barber* 2516, Cuddapah, *Barber* 2517, Nellore, *Barber* 2518, Tanjore, *Barber* 2529, N Arcot, *Barber* 2531, Bellary, *Barber* 2003, 2532, Godaveri, *Barber* 2533, Tinnevelly, *Barber* 2587, 2591 Vizagapatam, *Barber* 2594, Circars: Parlakemedi, *Burkill* 24120! Ganjam; in hedges at Chatrapur Madras Agri-Horticultural Society's Garden cultivated; naturalized in Mysore, *Butler*!

The references in *Aiton Hortus Kewensis* ii. 302 *Willdenow Species Plantarum* ii. 193 and *Gawler Bot. Mag.* t. 1522 are

so confused that the only safe course is to drop all three The plant dealt with by *Aiton,* though the point is now uncertain, the plant itself having disappeared may possibly have been the A Vera Cruz of *Miller* The *A lurida* of *Gawler* figured in the Botanical Magazine is not A Vera Cruz, nor is it any Agave known to us at present *A lurida* Jacquin, cited by *Willdenow* as the same as *Aiton's A lurida* and as *Miller's* A. Vera-Cruz, is very different from the plant here accepted as *Miller's* A. Vera-Cruz The difficulty in this case has been due to the acceptance by *Aiton* in *Hort Kew ed 2*, of *Willdenow's A lurida var a* which is based on A. Vera Cruz *Miller,* but also includes A lurida of *Jacquin,* as equivalent to his original *A lurida* That original *A lurida* may have been *Miller's* A Vera Cruz or it may have been *Jacquin's* A lurida, it cannot possibly have been both

AGAVE VERA CRUZ

Confused literature

DISTRIB Native country doubtful probably Mexico naturalized throughout Southern Europe south of the Alps and Pyrenees in Southern France and most Mediterranean Islands also in North Western Africa and Atlantic Islands, (not recorded from South Eastern Europe or the Orient); S Africa *Mauritius; Ceylon*

Agave Cantala *Roxb* *E*

AGAVE CANTALA described

A frequent Aloe of parts of India.

Leaves linear—lanceolate in a lax but even tuft from a short ascending rootstock, pale green sometimes glaucous, older darker tinted, very narrow in proportion to their length which attains 4 feet and more, the greatest width just above the middle being about 3 in, usually 2½ in, curving gradually outwards from their moderately thick bases, or in weak examples bent over almost from their origin, upper surface more or less concave, sometimes trough shaped in the lower portion, marginal prickles large for the leaf conspicuous falcate always ascending ¼ of an inch or more in length, very sharp, pale brown or garnet coloured from a small light coloured cushion, terminal spine usually acicular, cylindrical, reddish or dark brown, half an inch to an inch in length, scape with panicle 12—18 feet in height, inflorescence borne on flexuous rather slender branches, fascicles 1-2 flowered, germen equalling or shorter than the perianth, perianth-lobes bluntly linear lanceolate 1¼ in long, large in proportion to the germen, cup hardly any, lobes divided nearly to their bases, linear oblong obtuse, greenish yellow [Capsule not available] *Roxb Hort Beng. 25* A Cantula *Flor Ind ii 168, Ed Clarke 296, Grah. Cat.*

AGAVE VERA-CRUZ *described*

The Common Grey Aloe of India.

Agave Vera-Cruz . . D

Leaves linear-oblong, many, from a short stout trunk which is hidden by their thickened bases, sage green often very glaucous, early curving upwards, the ends usually more or less recurved or drooping, four to six feet long, often rather concave at the widest part which is above the middle and attains a breadth of ten inches and upwards, neck hardly constricted, leaf margins little indented or nearly straight between the prickles, which are broad stout, black or dark-coloured, spreading or decurved, interval between the prickles about half an inch or less, seldom ¾ in., terminal spine shortly channelled, ½—1 in. long, dark brown, not or very shortly decurrent; inflorescence panicled, trichotomous as regards the main branches which are curved and flattened, blossoms in pairs with a subsidiary bud laterally developed at a different level, germen smooth cylindric longer than the perianth, perianth-lobes linear-lanceolate of a pale amber tint, cup herbaceous, stamens much exserted, anthers half an inch in length and upwards, pollen dull-yellow, style very faintly lobed, capsule rather turgid oblong-cylindrical, tip rounded, seeds black shining *Miller, Gard Dict ed 8. n 7.*

Agave lurida, *Zuccarini in Nov Act. Leop Carol xvi. 2 670, tt. 49, 50, Mart Flor. Bras iii. I, 185, Bak in Gard. Chron N S vii 264 (1877)* excl var *Jacquiniana* and ref; not of *Jacquin Coll iv 94, t I*, nor of *Gawler Bot. Mag. 1522* Agave Vera Crucis *Haw. Syn Succ 72*

INDO CHINA Burma, Taungtha, *Burkill* 23,777! and other localities in dry Central Burma, *Burkill* Assam, Cachar, *Burkill* 16200! Brahmaputra Valley frequent, *Burkill* 19958!

INDIA Bengal, Katihar, *Burkill* 20871! Gangetic delta, frequent, Botanic Garden, Sibpur, cultivated. Upper Gangetic Plain, from Tirhoot (in hedges) to Rohtak (S E Panjab), *Burkill* 18173, but usually planted, cultivated in Botanic Gardens as far as Lahore Chota Nagpur, Singhbhum, *Burkill* 19759! Central India, Bilaspur Western India, Bombay, cultivated *Burkill* 16682! 16686 Deccan Miraj, *Burkill* 16712! South India Bellary, *Burkill*; Chingleput, *Barber* 2401 Guntur, *Barber* 2042, 2065, Chingleput, *Barber* 2036, Kurnool *Barber* 2041 2068, Salem, *Barber* 2070, Kistna *Barber* 2501, Coimbatore, *Barber* 2502 Madura *Barber*, 2503, 2505, Anantapur *Barber* 2513, S Arcot *Barber* 2516, Cuddapah, *Barber* 2517, Nellore, *Barber* 2518, Tanjore, *Barber* 2529, N Arcot, *Barber* 2531, Bellary, *Barber* 2003, 2532, Godaveri, *Barber* 2533, Tinnevelly *Barber* 2587, 2591 Vizagapatam, *Barber* 2594, Circars Parlakemedi, *Burkill* 24120 Ganjam, in hedges at Chatrapur Madras Agri-Horticultural Society's Garden cultivated naturalized in Mysore, *Butler*!

The references in *Aiton Hortus Kewensis* ii. 302 *Willdenow Species Plantarum* ii 193 and *Gawler Bot. Mag.* t. 1522 are

which has hardly any cup, the lobes being deeply divided, equal to or longer than the germen, bluntly linear lanceolate thin and faintly striate [Capsule not available] AGAVE Species F described

INDIA Dehra Dun *J S Gamble No* 23247 Upper Gangetic Plain Etawah *Burkill* 18134!

DISTRIB Native country unknown Planted along Railways in N W somewhat extensively

This species differs from **A. Cantala** Roxb in the stiff upright leaves which are never involute and hardly concave, do not bend outwards and are seldom recurved even at the tip It also differs as regards the flower which is smaller than that of **A. Cantala** and is more delicate in texture It appears to be the Agave described by *Mr T. Moore* in *Gard Chronicle No 37 of 1849 pp 583 and 615* as being inflower in the Chelsea Garden in that year, which he referred doubtfully to the *A mexicana* of Haworth *Mr. Gamble* called his plant "*A mexicana,*" referring possibly to the species described by *Moore* which is seemingly distinct from the *A mexicana* of *Baker* whose "var *cyanophylli*" (*Gard Chron 1877 viii, fig 36 p 201*) may be the species of *Miller's Figures* (*vol II p 148 Pl ccxxii*)

Agave sisalana *Perrine* . . *G* AGAVE SISALANA. True Sisal

Leaves 20—35, oblong lanceolate, never forming a rosette but closely tufted on the rhizome or on a very short ascending caudex which is completely hidden by their moderately thick bases, the inner making a very sharp angle with the axis, the outer gradually receding but still making less than a right angle, neck not at all constricted, colour deep green, sometimes glaucous, up to six feet long, breadth at the widest part which is just above the middle reaching ten inches, margin with or without prickles, which, if present, are weak, scattered and pale-coloured, terminal spine not channelled, glossy, purple or dark brown, scape 15 feet or more with the panicle, fascicles of blossoms rather crowded, germen equal to or shorter than the perianth slightly broadened upwards, base of perianth convex and somewhat dilated, limb suddenly contracted narrowly ligulate tip slightly hooded, style long very faintly lobed early protruded [Capsule not available.]

INDIA: Introduced into various parts of the country between 1885 and 1892. Cultivated in Burma Cachar and Sylhet, Assam Bengal North West India as far as Lahore, Central India Bombay, Deccan (Poona) Mysore, Madras

DISTRIB Native country unknown* introduced from cultivation in Yucatan in 1834 to islands (Keys) off the peninsula of Florida and there naturalized Introduced into the West India Islands partly from Florida partly from the American continent Supposed by *Schott* and *Engelmann* to be derived from a wild species but further evidence as to Yucatan species is wanted these appear to be several in cultivation there Cultivated in Australia, F j Hawaii and German East Africa

In India this species varies as regards presence or absence of spines on the leaf margins We have seen (*a*) spines fully developed, (*b*) spines partially and irregularly developed and (*c*) spines altogether absent on leaves of the same individual plant

AGAVE

Agave sp *H*

Species H described

Leaves 20—35, oblong lanceolate, not forming a rosette, the inner ascending at rather a sharp angle with the axis from a stout caudex which is altogether hidden by their much dilated bases which attain a thickness of four inches and over,† the ends recurved for about a fourth of the total length and drooping dull dark green very often glaucous reaching seven feet in length and ten inches in breadth at the widest part, which is above the middle marginal prickles distant (at intervals of 1¼ to 2 in) stout falcate yellow brown from a broad pale cushion which is inserted in the leaf edge its pellicle being easily separable from the leaf cuticle and leaving a regularly defined lunate scar on detachment of the thorn — terminal spine not decurrent rather short but stout slightly recurved, scape attaining 20 feet with the panicle which consists of rather slender wavy main branches spirally inserted one above the other at about a foot s interval on the main stem, fascicles of blossoms somewhat crowded at the ends of the main branches but not thyrsoidly congested perianth about equal to the germen which is rather sharply constricted just below

* [illegible]

was A sisalana Perrine and had been introduced (from the W India Islands probably) by Spanish colonists or even previously (*cf* p 2 5 of the same work) by the natives

† In most Euagaves and Furcrœas the outer leaves droop and wither with age and also when the plant is flowering characters taken from the leaves apply to leaves in their prime which are usually in the middle of the series.

the perianth, lobes of perianth dilated, almost saccate below, blade suddenly narrowed ligulate diminishing to the obtuse tip which is subspathulate, capsule about 2 in long narrowly turbinate strongly sulcate at the top especially

AGAVE

Species H described

INDO CHINA Burma, Southern Shan States Lwekaw and Saga *Abdul Khalil!*

INDIA Bengal, planted in a hedge at Barrackpore!! Upper Gangetic Plain; Saharanpur and elsewhere, planted and naturalized in hedges!! Dehra Dun, naturalized and in hedges! Cultivated at Lucknow, where received from Central India, also at Lahore Madras, N Arcot, *Burkill* 15145! Chingleput 2087 *Barber!*

DISTRIB Nat country unknown

This is the finest of the naturalized Indian species and might, by the description, be near an Agave from Jamaica (*Sir D. Morris*) described by *Mr. Baker* as *A Morrisii* in *Gard Chron Ser iii I, part 1, (1887) p 549, fig 105*, but we think that the Indian plant is very closely allied to *A sisalana*. The freshly cut leaves smell like stalks of Rhubarb

Agave Wightii *nobis** J

AGAVE WIGHTII described

The small Aloe of India

Leaves ensiform linear-lanceolate, very many, inserted in a compact series on a stout usually conspicuous trunk which is partly procumbent, or throughout ascending, forming a stiff even rosette 3 to 5 feet in diameter, pale green often tinged with ashy grey, base thin broadly amplexicaul, length attaining 3 feet, but not more than 2¼ in on an average, breadth at the middle where the leaf is widest 3½ in or less, flat or very slightly convex, marginal prickles rather weak about ¾ in apart, sometimes spreading or erect, but usually consisting of a small brown cushion carrying a semi-transparent garnet-coloured spine which is often sharply recurved parallel to the leaf edge, but ends in a finely-barbed hook which invariably points upwards, terminal spine about half an inch long, pale, slightly

* A Wightii *nobis*—Caudice amplo manifesto foliis 2—3 pedalibus medio circa tres uncias latis basi parum incrassata late dilatata summum caudicem amplectentibus lineari lanceolatis griseo viridibus foliorum margine spinis ad 15 pedes superne in ie herbacea seminibus opacis

AGAVE WIGHTII described

decurrent, scape twelve to fifteen feet high with the panicle, which is oblong-pyramidal, the main branches short trichotomous, fascicles rather crowded, germen nearly spindle shaped rather shorter than the perianth and constricted below it, cup of perinath soon dividing into six lanceolate segments each ending in a narrowly ovate lanceolate limb, which is slightly thickened at the obtuse tip and (in dried specimens) obscurely hooded, greenish yellow, capsule brown very broadly turbinate 1¼—1½ in long rostrate by the indurated bases of the perianth lobes, seeds opaque dull charcoal coloured

Agave vivipara — *Wight Ic 2024, Bal Gard Chron N S xiii (1877) 780 excl all syn except Wight*, not of *Linnaeus*, nor of *Hill (Veg Syst xxiii f 56 fig sinistr)* nor of *Miller* nor of *Aiton*, nor of *Dalz and Gibs Bomb Flor* Agave Cantula, *Dalz and Gibs Bomb Flor* not of *Roxb*

• INDO CHINA Sylhet Moulvi Bazar planted near villages but not plentiful, *Wyper*

INDIA Bengal Burdwan *Burkill* 18930! Hughli Howrah in hedges cult in Botanic Garden Calcutta Tirhut Turkaulia, *Burkill and Prain* 19023 Upper Gangetic Plain Moradabad *Burkill* 14951! Delhi *Burkill* 14063 Rohtak planted in hedges *Burkill* 18184 commonly naturalized from Saharanpur and Ludhiana as far as Delhi, *J R Drummond* !! Cult and naturalized in Hort. Saharanpur, *Duthie*! Central India, Gwalior, *Maries*! Dehra Dun *Basu*! Deccan, Berar *Burkill* 19179 Buldana *Burkill* 19179 Takari *Burkill* 16706 Sattara Road *Burkill* Poona, *Burkill* 15816 Western India Bombay *Burkill* 16677 and 16687! South India Madras cult and naturalized in and near Agri Horticultural Society's Garden, Chingleput in hedges *Barber* 2402! Madura *Barber* 2504! Tanjore Dist *Barber* 2515, 2565! Malabar Dist., *Barber* 2535!

DISTRICT — Native country unknown A variegated form cultivated in public gardens throughout India is very near this, if not identical

AGAVE DECIPIENS described

Agave decipiens *Baker* . . . . *K*

Leaves fleshy linear many closely inserted on an often erect caudex which attains 3 to 4 feet in height, forming a compact radiating tuft, of which the outer leaves are nearly at right angles with the axis, the inner making gradually an acuter angle, 2—4 ft long, widest just below the middle where the breadth seldom exceeds 3½ in, basal fifth of leaf bluntly trigonous, convex on the sides forming a stalk, upper portion concave often forming a deep U-shaped trough above the middle, the whole leaf stiff, glossy apple-green, more or less recurved and falcate longitudinally, marginal prickles half an

inch to 1½ in apart, red-brown, very small but sharp, base inconspicuous, seated on a deltoid prolongation of the light green leaf edge terminal spine half an inch long and more, with a shallow channel, not decurrent, blackish, very sharp, inclining backwards

AGAVE DECIPIENS described

[For the inflorescence which we have not seen, we are indebted to *Mr. J. G. Baker* (*in Kew Bulletin, July-Aug 1893, CCLVII* False Sisal) as follows,—

Peduncle with panicle about five times as long as the leaves *Panicle* 8—10 feet long, with a rather flexuose axis, and usually single dense clusters of flowers terminating the laxly disposed simple arcuate branches

Flowers arranged in dense clusters Ovary oblong finally 2 in long, ⅜ in diam *Perianth* greenish-yellow, an inch long, tube broadly funnel shaped, lobes complicate lanceolate from a dilated base, twice as long as the tube *Stamens* 18—21 lines long, inserted at the middle of the perianth tube, anthers linear ½ inch long *Styles* finally reaching to the top of the stamens]

Cultivated only in Botanical and Horticultural Gardens at Calcutta Saharanpur and Lahore naturalized in Florida with A sisalana Perrine native country unknown

From *Karwinski's* description quoted by *Kunth* (*Enum. V. 835*) *A Ixtli* Karwinski, a native of Yucatan, should be very near this species The plant sometimes termed *A Ixtli* in Indian Gardens has nothing to do with *Karwinski's* plant or with A. decipiens *Baker.*

The best known of the fibres called "Istle" or "Ixtli" in Mexico ("Tampico fibre" of the trade) is not derived from any Euagave and has nothing in common with *Karwinski's* A Ixtli except the name The Istle which has been identified by *Spon* and others with *Bromelia sylvestris* or *Nidularium Caratas* is of course altogether distinct, but *Mr. Dodge* has perhaps not hit on the correct solution of the puzzle *Mr. J C. Harvey,* writing from the state of Vera Cruz, informs us that the Ixtli of that region is a Bromeliad which yields a good fibre The confusion has arisen from forgetting that a vague vernacular name may cover half a dozen different species utilised in as many different areas

Ixtli fibre.

Confused nomenclature

A Ixtli, Salm (of *Gartenflora* 1883 *p 149 cum fig p 150*), is identified with "*A Karwinskii*, Zucc *in Kunth's Enum V.*

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

ra gigantea of *De Candolle* (*Plant. Succ. Hist. 126*) or *fœtida* of *Jacquin* (*Ic. Pl. Rar. F.* 379) which are the same as *Plukenet's Aloe americana radice tuber sa r non spinosa, Phytog. t. 258, fig. 2; Almag. p. 19,* o leaves of the plant figured by these authors are s fetid Nor does it agree with *F. gigantea*, Baker *on. N. S. xi. (1879) p. 623*) because the leaves of his brown pungent points, whereas in our plant the en, blunt and not at all pungent. Further, the leaf plant is described as much thinner in the middle, of an inch, as against five-eighths to three-quarters in our plant. What appears to be the *Agave* innaeus is in cultivation as a hedge plant in the rden, and is manifestly distinct from either of the ted to yield marketable fibre in India.

FURCRAEA Species 1 Nomenclature.

Agave Foetida.

urcræa sp. 2

FURCRAEA Species 2 described.

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ON CERTAIN SPECIES KNOWN IN INDIA.

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A Ixtli, Salm (of *Gartenflora 1883 p 149 cum fig p 150*), is identified with "*A Karwinskii*, Zucc in *Kunth's Enum V.*

AGAVE DECIPIENS

387" and with *Engelmann's A rigida* (387 is a slip for 837), where *A. Karwinskii* of *Zuccarini* is described from the *Nova Acta Acad. Carol. Leopol l*, the description not agreeing very well with the sketch in *Gartenflora*, which is like *A. ixtlioides* of *Bot. Mag. 5893* "*A rigida*" of *Engelmann*, which includes A sisalana *Perrine*, is, so far as sisalana is concerned, a very different type of Euagave.

FURCRAEA Species 1 described

Furcræa sp . . . *1*

Leaves 20—40 rather sharply ascending from a short fairly stout trunk forming a compact tuft. obovate-lanceolate, bright green, upper surface glossy, perfectly smooth on both surfaces, 4—6 feet long and upwards, breadth at widest part which is somewhat below the middle 8 5 in, thickness at this point 75 in or under, hardly constricted above the base which is 4 in across by 2 5 in or less in thickness, margins irregularly furnished with weak spreading prickles, pale below, rust coloured upwards, occasionally quite spineless, margins involute just below the leaf-apex forming for the last ·75 in or less a green canaliculate blunt unarmed acumen

[Inflorescence not available.]

INDIA cult in Botanic Gardens Calcutta, Saharanpur, Lal Bagh, Bangalore (also a variegated form) and most public Gardens in India, Dehra Dun, *Basu* (but probably from a garden)! planted by Railways in the Deccan, Miraj, *Burkill*, planted and naturalized in W Mysore, Yercaud, and on the Shevaroy Hills, *Cameron*, near Coonoor *Butler*!

DISTRIB The native country is not accurately known it is understood to be extensively cultivated from Venezuela to E Brazil, whence it was introduced by Father Leries almoner (of his order?) to the Mauritius, in the 16th century (*Aublet* I 305) and from the Mauritius, we suppose, to S India, where it is known as "Mauritius hemp."

The leaf* when crushed exudes a colourless fluid which has a faint but by no means fœtid odour This plant can hardly be

* Both surfaces of the leaf in this Furcræa have a minutely punctulate appearance This under the lens is found to be due to groups of stomata, in each of which the lumen is occluded by an inorganic laminated octahedral body In F. Sellоa (and presumably other species in which the back of the leaf has an "emery paper" feel) these occluded stomata are more numerous, and accompanied by minute cones of the same inorganic structure, ending in an edge like that of a cutting diamond, with their sides laminated, embedded in the cells of the epidermis and extruded from a cavity which is probably a metamorphosed stoma-chamber

For the microscopical analysis we are indebted to *Dr Irvine Fortescue*, lately Offg Curator of the Royal Herbarium, Calcutta.

the *Furcræa gigantea* of *De Candolle* (*Plant Succ Hist 126*) or the *Agave fœtida* of *Jacquin* (*Ic Pl Rar I* 379) which are apparently the same as *Plukenet's Aloe americana radice tuber sa fœtida minor non spinosa, Phytog t 258, fig 2, Almag p 19*, because the leaves of the plant figured by these authors are described as fetid Nor does it agree with *F gigantea*, Baker (*Gard Chron N S xi (1879) p 623*) because the leaves of his plant have brown pungent points, whereas in our plant the point is green, blunt and not at all pungent Further, the leaf of *Baker's* plant is described as much thinner in the middle, one-eighth of an inch, as against five eighths to three-quarters of an inch in our plant What appears to be the *Agave fœtida* of Linnaeus is in cultivation as a hedge plant in the Calcutta Garden, and is manifestly distinct from either of the species reputed to yield marketable fibre in India.

FURCRAEA Species 1 Nomenclature

Agave Foetida.

Furcræa sp . . 2

FURCRAEA Species 2 described

Leaf sharply constricted above the base, light green, surface plaits obscure, tip cartilaginous ending in a small but distinct slightly recurved yellow brown spine about $\frac{3}{10}$ in long, branches of flowering panicle spreading, perianth segments linear-lanceolate, obtuse, white, externally greenish with faint darker stripes within, anthers rounded, filaments about four-fifths of an inch long, dilated, at the widest about $\frac{1}{8}$ of an inch broad, otherwise, so far as the material goes, very close to the preceding

India Mysore, *Butler* !

By *Baker's* description this should be his *F gigantea*, and it is evidently the same as *Wight Icones* 2025 It seems doubtful whether *F Commelyni* Baker be the same as *F Commelyni* Salm Dyck, which indeed seems to be the *Agave foetida* of *Linnaeus* and the *Furcraea gigantea* of *Ventenat.* The "*Mauritius Hemp*" of South India therefore cannot be with propriety spoken of as *F gigantea*

REMARKS ON CERTAIN SPECIES KNOWN IN INDIA

Indian economic writers have been constrained either to class the different "Aloe fibres" all under one head, or to classify them roughly under provisional names such as "*americana*,"—

AGAVE SPP Indian species have not been fully identified

"vivipara," etc (*Royle, Fibrous Plants of India London 1855, pp 41 50 Watt, Dict Economic Products, Vol I, pp 153-44*)

Royle was aware of it

Royle was aware (*Ill Himalayan Botany, p 374*) that several species of Agave were naturalized in India, and he gives *Banskeora* as the vernacular name of '*A vivipara*", but in his Report on Indian Fibres he did not attempt to discriminate between the species from which fibre was taken for the experiments detailed in his work, the reason obviously being that no one could say what plant was used for any given experiment — *Sir George (then Dr) Watt* (l c) writes as follows,—

Watt made it obvious

* * * * *

"*At the present moment it is next to impossible to arrive at any "definite knowledge regarding the species and varieties cultivated "for their fibre*"

* * * * *

"*An important step would be taken were the fibre-yielding "plants to be carefully referred to their respective genera The "account of A americana in the succeeding pages should be viewed "more as Aloe fibre plant since it seems probable that the name "A americana is popularly given to a series of species and varieties "yielding allied fibres*"

The first step indeed towards developing the "Aloe fibre" industry in India is to ascertain as accurately as possible what are the species of Agaveæ that are already naturalized or cultivated for their fibre, and it is to facilitate this that the present paper has been undertaken When we know what is already growing in the country, and how different species thrive in particular tracts, the proper authorities will be in a position to deal with the economic history and capabilities of the different species and to advise as to the encouragement of particular kinds in different localities or the introduction of new sorts, just as Agave sisalana was brought in through the efforts of *Sir George King*, thus reviving the public interest in these products which was weak or dormant so far as India was concerned since the work of *Roxburgh* was closed in the beginning of the last century.

Why the identification has been left so long

Living plants of this family are not always easy to describe or identify, while their classification by means of herbarium specimens has been so far found to be impracticable The bulk and habit of the plants,—the similarity of some

forms in their earlier stages,—above all the long and uncertain period of maturity which marks all the Euagaves and most Furcræas have proved serious impediments to the study even of living Agaves through public and private collections in Europe and America It is hardly surprising, therefore, that the botanical information should be imperfect (*cf Zuccarini Pl Nov vel Min. Cogn, Fa c I, Ratisbo i 1832, p 42*)

AGAVE PRODUCTS

Early Travellers to America made acquaintance of plants.

As regards the history of the economic species there is much to be found in the great work of *Martius* (*Flora Brasil Vol III, pars I, pp 190—197*) Following him largely, we conclude that the early European voyagers to the West India Islands found the existing occupants getting sundry products from different Agaveæ and Bromeliaceæ and that certain kinds were famous for their fibre, which was worked up into various commodities such as thread, coarse twine, nets, bags, and cordage "Floss" or tow was got from the leaves of a kind which was known to the English adventurers as "*Silk grass*" The dried tissue (medulla) of the flowering stem served for tinder, while a kind of paper,—or rather parchment,—was prepared from the same leaves that produced fibre for string-making From the "floss' cloth was woven The leaves of some species contain a detergent mucilage and both these and the roots were ordinarily used for the same purposes as soap until quite a recent period in the West Indies (For medical uses *Martius* (*l c*) and other authors cited by him may be consulted)

they found sundry products to be obtained by Haitians and Caribs from them

PRODUCTS AND VERNACULAR NAMES OF AMERICA

Martius believes that the fibre plants and their products were alike known to the Haitians comprehensively as "*Henequen*," the corresponding term in the Carib dialects being "*Pita*," and he suspects that the Carib Indians took at least one of the Furcræas,—and the name *Pita*,—to the shores of S America

Henequen

Pita.

From *Peter Martyr's* account of San Domingo it would seem that the word "*Magnei*" or "*Manguai*" also belonged to the native language of Haiti Be that as it may, the Spaniards took the names *Pita* and *Maguey* with them to the mainland, and applied the latter to species of Agave which they found abundantly cultivated on the table-land of Mexico for the sake of the saccharine juice which the leaves distil when cut just before "poling" The plant was known to the Aztecs as *Metl* (a generic term) and the liquor as "*Octli*" Fermented to a kind of cider (with the addition of a herb known as

Maguei or manguai

Metl

AGAVE PRODUCTS Pulque Aguardiente

Ocpath) *, it was, and is, the national beverage of Mexico— "*Pulque*" or "*Pulco*" A spirit is said to be made from the same secretion, and known as "*Aguardiente*," i e, "Firewater"

Caraguata Karato or Curaca

Another name, in the Islands especially, was *Caraguata*, *Karato*, or *Curaça* which applied particularly, it would seem, to the Furcræa tuberosa

Pati

"*Pati*" according to *Hernandez* was the Mexican name for a *Metl* which produced the finest fibre, or tow, and was probably the mainland equivalent of "*Henequ n*"

The term "*Pita*" has spread over the world and has been embodied even in the dialects of S India

Sources of pulque

Recent American investigations have shown (*J N Rose in Contrib U S National Herbarium, Vol V, p 228*) that there are several species of Euagave which yield '*Pulque*,' but the principal appears to be the A atrovirens of *Baron Karwinski*, which is identified by several continental botanists with *A Salmiana* of *Otto* From the descriptions as well as from photographic illustrations that accompany *Mr Rose's* paper, this form must be closely allied to *A lurida H B C*, but abundantly distinct from A. americana of *Linnaeus* As regards spirit yielding Agaves,

Sources of Mescal or Tequila

Sotol

Mr Rose states that the spirit is now called "*mescal*" or '*tequila*' and he adds "*while it is uncertain from what species tequil is m l it s ut   y rit   of A americana*' *S tol*, another alcoholic preparation which the traveller *Lumholtz* derived from a plant 'of the same family as *A americana*,' is produced, not from any Agave at all but from a Dasylirion *Hernandez*

Mexcal

figures a "*Mexcil*" that looks like the "*Agave Gilbeyi*" of gardens, which is not an Euagave.

Ixtli istle or Tampico fibre

One other native term requires mention, viz, that of *Ixtli* or "*Istle*" which is often applied to the plants that yield the product known commercially as "*Tampico fibre*" from the town of export Recent information as to these will be found in *Mr. Rose's* "*Notes on Useful Plants of Mexico*" (*Contrib U S National Herbarium, V p 242*) already quoted, as well as about other fibre plants of Central America, but the fact is that there is not a single fibre-yielding species of the Agaveæ or Bromeliaceae,—to say nothing of Yucca,—that can be said to have been as yet sufficiently identified

* In a recent publication this is said to be Datura Stramonium Linn., which is improbable; though it may be some other species of Datura

AGAVE PRODUCTS

"*Tampico*" or "*Lecheguilla*" fibre, however, is believed to be got from species that do not belong to Furcræa or Euagave, and its chief interest for Indian workers lies in the circumstance that "*Ixtli*" has been also reported as a name for certain Yucatan species of Agave, with this consequence (among others) that the well known "Sisal Hemp" (cultivated in the Bahamas and the British East Indies) appears in some botanical works as a variety of *A Ixtli* Karwinski or of *A Karwinskii* Salm. As the descriptive list of species will have shewn, we propose to call the true Sisal Agave of Florida and India A. sisalana, *Perrine* (ex Engelmann) or more briefly A. sisalana, *Perrine*

Ixtli applied wrongly to Sisal

True Ixtli or Tampico fibre Seems to come from no Euagave—the group, which is in India

The species included in our brief Descriptive List are not of course of equal economic value B=Agave americana *Linn.*, is not naturalized apparently in any part of India, but is grown in gardens and about houses as an ornament, the particoloured kinds being in vogue chiefly Small articles have been made from its fibre as curiosities, or for exhibition purposes, but this species does not seem to be grown or utilized for economic purposes in India, or indeed anywhere When "*A americana* is spoken of as a "*Fibre Aloe*," some other species almost always is intended

SPECIES IN INDIA ARE OF UNEQUAL VALUE

The true A americana is not a fibre plant

There is a widespread idea that there is quite a number of varieties of "*Agave americana*" There are several variations of the leaf, *e g*, with white bands along the edges, or a white stripe down the middle, due to the industry of horticulturists, but,—like other Euagaves so far as we have seen,—the essential characters of this well known garden species are particularly constant.

The native country is unknown (*A De Candolle, Geograph Botanique, p 983*), but may be in the W India Islands

As regards the fibre of Agave D., *i e*, A. Vera-Cruz *Miller*, (= "*A rigida*" of the *Calcutta Garden*) we have practically no information We believe that this is the Agave which is naturalized on a great scale in S Europe and N. Africa, in S Europe it is often called '*Agave americana*," and it was most likely the "*American Aloe*" of the earlier writers till *Linné* appropriated the specific name for the garden plant of N. Europe In India it is established as a hedge plant in Bengal and S. India, there are specimens from the Bombay neighbourhood also, but how far it may have run wild on that side

A Vera-cruz seems to be the so-called A americana of S. Europe

Distribution in India.

AGAVES IN INDIA
A vera-cruz

of India remains doubtful It occurs with other Agaves throughout the Gangetic Plain as far north as Cawnpore but usually though not always planted Further to the north and west it seems little known and we suspect that the climate of Hindustan and the Panjab is not well suited to it In the Royal Garden at Sibpur, where it was introduced by *Lord Auckland* when Governor-General in 1836, this Agave luxuriates Its range in Europe (under the continental name of "*Agave americana*") is shewn in an account and chart in *Gartenflora* 1875 by *H. Hoffmann** (*p 70 and t 825 No 1*)

Unknown origin

Sharp frosts are evidently fatal to it, unless it is artificially protected This might be expected if it was the plant which *Schiede* and *Deppe* saw wild in the country between Vera Cruz and the table-land of Mexico (*Linnaea, IV pp 208, 582 etc*) but the brief description of that rather suggests A Wightii

AGAVE species C

The reasons for giving C a place in the Descriptive List will be found under Part II, where it is suggested that this handsome species (formerly named "*Jacquiniana*" in the Saharanpur Garden) may be *Karwinski's* A atrovirens or some closely allied form

Agave Cantala perhaps first to reach India.

An important point about the next species in the List (E. = A Cantala *Roxb*) is that though utterly distinct from J of the same = '*A vir par* of *Wight* (in place of which we recommend the name of A Wightii) it has nevertheless been very frequently confused with it, as will be explained more fully in Part II of this paper A Cantala appears to have been the first Agave to reach the East Indies, which it did most likely from the Pacific Coast of Central America It is well figured in *Rumpf's Herb Amboyn*, and that illustration is quoted by *Roxburgh* as applying to his A. Cantala, which he supposed to be a native of India

Distribution

This seems to be a common hedge plant near Bombay, in the north of Madras, and in the Gangetic Plain, and extends

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* He includes certain stations of flowering in the open in Brittany and the S W of England which are usually given to the true *A americana* but it is quite possible that the plants which flowered there were *A Vera Cruz* *A americana* seems to be much hardier as *Miller* has noted The variegated specimen (see *Sir W Hooker's* note in S ...) from which plate 3654 Bot Mag was taken flowered at Aikenhead in Scotland

In August 1901 *A americana* Linn flowered in the open at Kingcausie, Maryculter, Kincardineshire in the N E of Scotland (*Dr Irvine Fortescue*)

into the submontane Districts of the Agra Province and the Panjab

AGAVE IN INDIA

Fibre has undoubtedly been extracted from this species on a considerable scale, but opinions on its quality are conflicting,

Agave Cantala a fibre plant

In the Dehra Dun and in the Panjab Siwaliks still another Euagave occurs in a half wild condition from which a good fibre has been got for certain purposes, and the same has been *planted on a marketable scale in the dry tract between the* Chambal and the Jamna This was sent to the Calcutta Garden as *A mexicana*, but as will be seen under Part II, *Lamarck's* "*mexicana*" is not a good species, and the rules of nomenclature debar the reapplication of the title to a different species We have not been able to identify the species clearly with any named Agave of which we have the description, and it has therefore to appear in the Descriptive List anonymously as Agave "F.", but it is pretty certainly the same as a species which blossomed in London in 1849 and was doubtingly referred by *Moore* to the *A mexicana* of Haworth (which is *not* that of *Lamarck*)

AGAVE species F also a fibre plant

"H" is a fine Euagave which occurs in several parts of Bengal and the Gangetic Plain as far North as Saharanpur, where it has run wild in the Botanic Garden, and is known, but incorrectly, as '*A lurida*' There does not seem to be any record of experiments with the fibre of this species, but the late *Mr. Gollan,* who had extracted it, informed us that it is of good quality so far as he could judge, and that the leaves are easy for the work people to handle

AGAVE species H

It flourishes under the same conditions as A Wightii, and the two, though otherwise strongly dissimilar, are often found in the same hedge, though not necessarily planted out at the same period

This has the largest leaf of all the Agaveæ hitherto observed in India attaining 7 to 8 feet and over, with a corresponding breadth, though the leaf is narrower proportionately than in A Vera Cruz for example We are disposed to refer it to the Sisalana group of Euagave There are specimens from Madras which we had placed under this species, but they seem poorly developed in comparison with those from N India.

The largest of all Indian Agaves in leaf

We have not yet mentioned the first species in the List, viz A, which differs from all the others by the margin of the leaf.

AGAVES IN INDIA

A. vera-cruz

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* [illegible]
S [illegible]
quite [illegible]
A [illegible]
spec [illegible]
was [illegible]

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AGAVES IN INDIA

Agave species A

It is included because the Saharanpur plant is possibly the same as a form received in the Sibpur Garden from Burma, and said to be naturalized in that country Very little is known of this **Agave**, which is also unidentified, further remarks upon it will be found under Part II

Agave Wightii

The last naturalized **Euagave** in the Descriptive List is a well-known form in southern Central and North-Western India In the N W it is looked on (as **A. Cantala** is in some parts of India) as *desi*, or "*native*," but this means no more than that it spreads itself without the direct aid of man, and that there is no current tradition of its introduction This species should be recognized easily by its round compact rosette, by the rather pale tint of the leaves and their stiff habit It is the only **Agave** in North India moreover that develops a conspicuous trunk, though this does not always happen

It may develop a stem

The division which has sometimes been adopted of **Euagave** into two groups of "*caulescent*" species and "*stemless*" seems inconvenient The same species may under one set of conditions, or at a particular stage of its development, appear to be stemless and yet develop a conspicuous stem or "*caudex*,"—somewhat on the plan of a small **Palm** or a **Yucca**,—at a later period or under altered surroundings The truth seems to be that all the **Euagaves** have more or less of a stem above the crown of the rhizome though it usually is concealed by the outer leaves in most of them At the same time certain species are more apt to develop a manifest trunk than others, although no known **Agave** attains in this respect the stage arrived at by one of the **Furcraeas** (**F. longaeva** *Zuccarini*). Probably the "caulescent" species shed their outer leaves periodically, pushing up the vegetative cone with more rapidity than the so-called stemless forms so that [illegible] trunk which [illegible]

Wide spread in India

[illegible] the process which takes place [illegible] species figured by *Wight* as "*A vivipara*" (I c 2024) This well-marked **Agave** is that most widely spread in the drier parts of India from Mysore to the Panjab, though from many intervening parts it has not been reported It extends to the very south of India and east to Bengal and Assam, but does not thrive well in a damp climate *Wight*, following *Buchanan* probably, referred his plant to the

"*rigida*" of the *Species Plantarum* but that is an utterly ambiguous species not founded on living or Herbarium material so far as we can discover, and the proper course is to drop the name altogether *Miller's* "*rigida*," which may be the "*rigida*" of some continental authors, is obscure, but it was certainly remote from the plant of *Wight* and *Buchanan* and we have proposed **Agave Wightii** accordingly — AGAVES IN INDIA

There remains only "G" of the Descriptive List, the "true sisal" which was introduced into Bengal some twelve years ago, as explained in *Bulletin* No 6, 1899 of this Department (Agave sisalana). — Agave sisalana

Under Part II, the history of this staple in America is fully considered and reasons stated for re-placing the present scientific name (*A rigida*, var *sisalana*) by A sisalana simply, as was done indeed by *Col Prain* in the Bulletin just quoted.

About the same time that the Bengal Government was bringing "Sisal" into N India, it was being introduced into the Mysore State as set out in an interesting note by *Mr Cameron* Superintendent of Government Gardens, Bangalore, from which an extract is subjoined as follows —

> "Acting on my advice, and kindly assisted by the authorities at Kew, the late Mr Ricketts was able, in 1892, to import 6,000 plants direct from Florida Prior to this date a few plants of *Agave rigida* had found their way into the Botanical Gardens, but it is quite impossible that the variety *Sisalana* had ever appeared in the Province before We may therefore take 1892 as the starting period of this important cultivation — Introduction into Mysore
>
> "The plants from Florida arrived in excellent condition in an open field which had formerly been cropped with ragi and other dry crops The bulk of the consignment was therefore laid down in a plot of land measuring only ½ of an acre With exception of occasional thinning out to relieve congestion and meet small indents, the original plants still remain in this position where they form an overcrowded and conspicuous clump Suckers were

AGAVES IN INDIA

SISAL Introduction to Mysore.

allowed to grow and the matured leaves of parent plants have not been cut, hence poling commenced in the 9th year or in 1901 Poling or the growth of the floral axis forming flowers fruit, seed and adventitious buds renders propagation easy as each pole gives birth to upwards of 2,000 buds, which shortly develop into bulblets that mature and fall to the ground

'It will thus be seen that the main object of cultivation in the Lal Bagh during the period under report has been to induce poling and render the plants hardy We shall now have ample material to commence cultivation for another object, if desired, viz, to produce Sisal Hemp, the valuable product of the leaf During the current official year 45 000 plants have been sold for that purpose, at a cost of Rs 1,000, a sum which more than twice covers the original outlay for introducing the species from Florida

In my opinion, cultivation should be left to private enterprise though in the case of arid tracts where ragi often fails to reward the raiyat, it may be feasible to substitute a crop of the kind But that could only be done when a real demand for hemp arises at convenient centres The advantages of the cultivation may be briefly stated as follows —

1 Land of a gravelly and stony nature is suitable
2 When land is planted up, the cultivation practically ceases for a period of 4 years, or until the matured leaves are ready for cutting
3 On suitable land failure of crop has never been heard of
4 The profit on an acre of land yielding crop is estimated at £4 to £5 per annum, that is 60 to 75 rupees.

"The large succulent growth obtained in rich land is inimical both to the quantity and quality of fibre produced, therefore somewhat poor land of a loose

stony nature is always preferred, as in addition to giving better results generally it accommodates a larger number of plants to the acre Mysore possesses plenty of such land, and if the latter can produce leaves of four feet in length it will do But there is a reduction in value, as well as difficulty in extracting the fibre, when the leaves are under three feet in length In Yucatan, plants are put out in rows at 7, 8, 9 and even 12 feet apart, according to the nature of the soil But the general practice is to allow nothing under 400 plants to the acre while 660 is considered about the maximum number In the Bahamas the planting is somewhat closer When a plantation is once established it may be profitably worked for a life time, care being taken not to let the plants pole or become exhausted from over cutting In a large plantation drives are left at convenient intervals to facilitate the easy removal of leaves" AGAVES IN INDIA SISAL Introduction to Mysore

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Recent information on the growing of A sisalana will be found in the Year Book of the United States Department of Agriculture for 1903 (*Washington 1904, pp 395—396*)

The only Furcraea that is grown on any scale in India is the "Mauritius Hemp" This is established in the extreme S W of India, in N India it has recently been used for fibre with other Agaveæ, but it is not known to what extent it is in cultivation for this purpose, the identification of this species is considered in the Descriptive List under Furcræa FURCRAEA IN INDIA

To sum up as regards Indian economic species of Agave, those at persent known are E,—F,—G,—J of the Descriptive List,— SUMMARY OF USEFUL SPECIES IN INDIA

E is Agave Cantala *Roxb*

G is A ——sisalana *Perrine*

J is A ——vivipara *Wight*, which we have called instead A Wightii

"F" unfortunately is without a name for the present. It seems intermediate between A Cantala and the Sisalana series, and would probably repay investigation

SUMMARY OF USEFUL SPECIES IN INDIA

We suspect that "H" (the large species wrongly called "*Iurida*" at Saharanpur) is also allied to the Sisalana group,—and careful experiments upon its fibre are very desirable

"J" will doubtless hold its own as a hedge plant, especially in the drier provinces, but the shortness of the leaf handicaps it as against other species

We know nothing really about **A Vera-Cruz (D)** as regards its fibre but the prickly margin of the leaf has to be reckoned with This species stands a moist atmosphere rather better than **A sisalana** possibly, but the species "H" is perhaps the most adaptable to varieties of climate We do not pretend to offer an opinion as to soils for planting **Agave** but botanical considerations as well as experience in the different gardens, suggest that the composition of the soil is not of much importance,—always provided it is well drained and sloped, or elevated sufficiently to guard against water logging An important factor, of course, in the cultivation of **Agave** or **Furcræa** is the provision necessary to meet the effects of poling, but where space is available this can be met by marking out the plantation into blocks, and planting these on a fixed working plan in successive years so as to maintain a continuous supply of leaves of the proper age from the different blocks in rotation

In a letter from the State of Vera Cruz the following remarks on the native soil and climate of the **Agaves** occur —"In our rich clay loams here with 125 inches of rain distributed over nearly nine months of the year—as might be expected—Agaves are non existent," but it is added, that "on the Pacific side of the Isthmus, * * in the State of Oaxaca, where the rainfall dwindles away to 30 or 40 inches with over eight months' dry season, and a gravelly or rocky soil, I have observed Agave and Cacti in abundance" This lends confirmation to Mr Cameron's suggestions, but the merit of such situations probably depends on their facility for drainage

Our reasons for including "K" in the List will be found in the following Part (II) of this paper It is the **A decipiens** of *Mr. J. G. Baker* which is possibly the same as **A Ixtli** of *Karwinski* and is known in Florida as "false Sisal" It is only known in India in Botanical collections at present

PART II—HISTORICAL AND SYSTEMATIC

The genus Agave was founded by *Linnaeus* on a species which he introduced into the University Garden at Upsala From an MS work of his in Swedish, printed at Upsala by T. M. Fries in 1899, it appears that a specimen of the plant which he afterwards described as *Agave foliis spinoso-dentatis mucronatisque* in the *Hortus Upsaliensis* (*Stockholm, 1748, p. 87*) flowered at Noor between Stockholm and Upsala in 1709 and in this MS ("*Hortus Uplandicus*") *Linnaeus* identifies the plant that flowered at Noor with the *Aloe ex America* of *Dodoens* and the *Aloe folio in oblongum aculeum abeunte* of *Tournefort*. These synonyms among others are given in the *Hortus Cliffortianus* (*Amsterdam 1737*) for the plant to which he subsequently gave the name of Agave americana (*Sp Pl ed. 3, 1764, Tom I 461*) We will return to the Agaves in Clifford's garden later, observing meantime that when first imported into Europe from the New World, Agaves were classed by the science of the day with *the Aloe* of *Dioscorides* (or "*Bitter Aloe*") owing to the similarity of foliage

It has been questioned (*Bertolon. Fl It IV 157*, also *Visiani Fl Dalmat I, 124*) whether the Agave which has become widely naturalized in S Europe was in fact imported and not actually indigenous, but the evidence against any Agave being a native of Europe is overwhelming

The ingenious argument of *Ernst Meyer* (*Bot Zeit. 25, April, 1856*) turns on a drawing made in the 15th century, or earlier, of a plant said to occur in India, Persia, Greece, and Apulia in a work on Simples composed by one *Mathias Platearius*, principal (in the 11th century?) of the Medical School at Salerno founded by Charlemagne [illegible]

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SUMMARY OF USEFUL SPECIES IN INDIA

We suspect that "**H**" (the large species wrongly called "*lurida*" at Saharanpur) is also allied to the Sisalana group—and careful experiments upon its fibre are very desirable

"**J**" will doubtless hold its own as a hedge plant especially in the drier provinces, but the shortness of the leaf handicaps it as against other species

We know nothing really about **A Vera-Cruz (D)** as regards its fibre but the prickly margin of the leaf has to be reckoned with This species stands a moist atmosphere rather better than **A sisalana** possibly, but the species "**H**" is perhaps the most adaptable to varieties of climate We do not pretend to offer an opinion as to soils for planting **Agave** but botanical considerations as well as experience in the different gardens, suggest that the composition of the soil is not of much importance,—always provided it is well drained and sloped, or elevated sufficiently to guard against water-logging An important factor, of course, in the cultivation of **Agave** or **Furcræa** is the provision necessary to meet the effects of poling, but where space is available this can be met by marking out the plantation into blocks, and planting these on a fixed working plan in successive years, so as to maintain a continuous supply of leaves of the proper age from the different blocks in rotation

In a letter from the State of Vera Cruz the following remarks on the native soil and climate of the **Agaves** occur —"In our rich clay loams here with 125 inches of rain distributed over nearly nine months of the year—as might be expected—Agaves are non existent," but it is added, that "on the Pacific side of the Isthmus, * * in the State of Oaxaca, where the rainfall dwindles away to 30 or 40 inches with over eight months' dry season, and a gravelly or rocky soil, I have observed *Agave* and *Cacti* in abundance" *This lends con-* [illegible]

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Agaves are American.

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The first use of the name.

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* From a root meaning (inter alia) "to turn sour or bitter," or from a derivative that means arid rocky places, which the best medical Aloe inhabits.

SUMMARY OF USEFUL SPECIES IN INDIA

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great part of his earlier life in the Mexican possessions, and was manifestly a close and intelligent observer.

AGAVE GROWTH OF EUROPEAN KNOWLEDGE ON MAGUEY.

The *Thesaurus* (Cap. XII) gives about twenty different sorts of *Metl* with woodcuts of nine which, though rough, are usually good, but in the case of "*Maguei*" the inflorescence seems to have been added wrongly, as the flower is not that of an *Amaryllidea* at all or indeed attributable to any allied order. This is repeated by *Morison (Plant Hist. Oxon. ed. 1680 p. 417 and t. 22 Sect. 4)*, for his "*Aloe (3) americana flore luteo*" His letterpress is largely taken, as regards the "American Aloes," from *Hernandez*.

16th Century

The earliest mention of the Maguei that we have been able to trace is attributed to *Peter Martyr* (*De Rebus Oc. et Orbe Novo, Basel,* 1533) as quoted by *Martius,* l.c, p. 192 and by *Danielli, Nuovo Giorn Bot. Vol. XVII, Fasc.* II, *April 1885.* Peter Martyr.

Peter Martyr seems to have known the plants, which were produced in San Domingo; he compares them to palms, and says that the inner leaves were eaten by the natives. He further states that the name in the Haitian language signified a drum (or cymbal ?). In the older books it is noted that a kind of parchment or paper was made from the leaves of Agave, so it is possible that *Peter Martyr* was mistaken, and that the tambourines of the Haitians were called after the Agave and not, as the quotation suggests, the plant from the instrument.*

Oviedo (v. *Martius,* also *Danielli,* ll cc) in the 16th century mentions at least three kinds of fibre-yielding plants of the West Indies, viz.:— Oviedo

(1) Henequen, (2) la Cabuja, (3) Maguey.

Martius (*Beitrag zur Natur-und Literatur-geschichte der Agaveen*) has gone fully into *Oviedo's* account and regards four species as indicated; he concludes that the Maguey Agave was not "*A. americana*" (of *Humboldt* and others) but a species of the Islands which he specifies as "*Agave vivipara*" He quotes a passage in which *Oviedo* refers to the Maguey of the Mainland, and this seems to support the conclusion that the species of the Islands from which soap and fibre are obtained differed from the Maguey of Mexico.

From 1568 to 1572 an Englishman named *John Chilton* travelled over nearly the whole of Central America and in his Chilton

* *Zam*[illegible]
usually rega[illegible]
more as if[illegible]
Turkish cy[illegible]
shoot of a [illegible]

AGAVE GROWTH OF EUROPEAN KNOWLEDGE ON MAGUEY

account (see "*A notable Discourse, etc*," in *Hakluyt's Voyages, London, 1598, Vol III, p 462*) it is noted that, "*about Mexico and other places in Nova Hispania there groweth a certain plant called Magueis which yieldeth wine, vineger, hony, and blacke sugar, and of the leaves of it dried they make hempe, ropes, shooes which they use, and tiles* for their houses, and at the end of every leaf there groweth a sharp joint like an awle, wherewith they use to bore or pearce thorow anything*"

Hawkes

Hawkes, a merchant who resided in New Spain about the same period (*l c p 463*) also mentions the "*Magueis*" as the source of a wine which is called "*Pulco*" In 1601 *Hakluyt* published a translation of

Galuano.

the "*Descobriomentes*" (published 1563) by *Antonie Galuano* who was Governor of the Portuguese East Indies in the earlier half of the 16th century This contains a full account (among other wonders of New Spain, such as the Humming Birds) of the **Metl** or **Honey Tree**, which is unmistakeably the **Maguey** or **Metl**† of *Humboldt*

Lopez

F Lopez de Gomara (author of the *Life of Cortes*) gives a similar but more exact account of the *Metl*, adding that the Spaniards call it *Cardon*

In his *General History of the Spanish Indies* published

Acosta.

about the same period *Acosta* (*c Dau lh, l c, p 68 quoting Martius*) describes '*El Arbor de las Maravillas es el Maguey*" as a *Peruvian* species differing from that of New Spain (*i e* Mexico)

From these different histories it is clear that one kind of

One Maguey or Metl in one place another in another

Maguey was known in San Domingo and other West Indian Islands from the time of their discovery by Europeans, and that different plants, probably **Agaves** or **Furcræas**, which were employed for various economic uses on the mainland were identified with the Island kinds by the Spanish‡ conquerors, of which the best known was the wine producing **Metl** of the Mexicans As has been noted, however, there were several kinds of **Metl**

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* This use is noted in the *Canaries* where **Agave** is naturalized by Leopold von Buch (*French translation of Chap IV of the main work reprinted from Archives de Botanique after 1917*)

† The early writers whose etymology was comprehensive clearly connected the Aztec appellation with the honey which distils in the perianth of different species of Agaveae

‡ This was written before we had seen Martius' "*Beitrag, etc*," in which he arrives at a similar conclusion

The Spanish conquests in Central America were established by the year 1525 and not long afterwards at least one species of Agave had appeared in S. Europe AGAVE APPEARS IN S EUROPE

Charles de Lecluse (*Clusius*) while travelling in Spain about the third quarter of the 16th century saw a plant growing in a convent garden near Valentia, which he has described as *Aloe americana* (*Rariorum Stirp. per Hisp. 1576*, also *Rar. Pl. Hist. Antwerp, 1601, p. 160*), and identifies with the *Metl* or *Maguey* of *Gomara*, whose account he incorporates. *De Lecluse* took offsets from the convent specimen (which had not yet flowered) and sent one of these to a friend's garden in the Netherlands *M. Charles Martins* (*Bull Soc Bot de France, II, p 9*) notes that the woodcut in the *Historia* was taken from the specimen that was sent to this friend and that this subsequently flowered at Antwerp This figure gives a fair representation of an Agave of the type of *Humboldt's "americana."* 16th Century. Clusius found it in Spain, sent it to Netherlands

Almost simultaneously or a little later, *Caesalpino* saw an Agave in flower in the garden of the Bishop Tornaboni, probably near Pisa, which is eloquently described in Cap XXXII of his "*De Plantis*" as "*Alterum genus* [viz.. *Aloes*] *ex India Occidentale advectum etc*" Caesalpino. Found it in Italy

Danielli says, with much justice, of the accounts which occur from this period with increasing frequency of "*Aloe americana*" having flowered at such and such a spot in Europe, that it is impossible to say which of the species of Agave (Sect. *Euagave*) was seen by the observers; but *Caesalpino's* excellent description suggests that the specimen he saw was not A. americana of *Linnaeus*. These canno be identified

Cortuso, Superintendent of the Botanic Garden at Padua, had an Agave in cultivation before 1561, which is said to have been the first introduced into Italy (*not* Europe, as by a slip,—often pointed out,—was stated in the *Species Plantarum*). Cortuso; grew one in Italy

The story that the Agave first flowered in Europe at the papal city of *Avignon** in South Eastern France in 1599, seems to rest upon a pious opinion, of which the genesis can be divined by consulting the original authorities (for references see Danielli, l.c, pp 84—85, and Ch. Martins, l c., 9 to 11). France received plan probably from Italy.

* *Danielli* notes that the Agave was probably taken by Italians settled in Avignon to that city from Tuscany In a French work on the plants of the Trianon garden it is said that "A americana" was first brought to Paris from the Mauritius in the 17th century.

AGAVE SPREADS IN EUROPE

An account by *Pierre Borel* a Languedocian who was some time physician to Louis XIV ("*Hortus* * * * *cum accurata descriptione etc*" *Castries 1666 Paris 1669*) has been the source of sundry evergreen traditions about '*Agave americana*' Borel is quoted in the *Historia Plantarum* (*London 1686, p 1198*) as follows —

Borel had it near Montpellier, his account of its polling

"*Petrus Borellus Aloe plantæ caulem cum perlongum tempus sine eo remanserit tandem erumpere scribit cum fragore et strepitu et impetu facto tota in truncum fere convertatur coram mirantibus hominibus incrementum tantum suscipere ut etiam Quercum mediocrem aequet et 30 circiter palmarum altitudinem et femoris crassitiem acquirat floribusque in summitate decoretur Quodque magis mirandum intra paucos dies* [*quatuor vel quinque*] *hanc molem attingere, adeo ut incrementum ejus etiam oculis percipi potuit Tale quid visum nuper apud Monspelienses etc credat Judaeus Apella*"

The last three words are not of course in Borel but are *Ray's* comment, and produced later dissertations but the facts collated by *M Charles Martins* (of Montpellier) *Danielli* and others shew that the flowering of different species of Agave (Euagave) in Europe may be delayed from the sixth to the eighty second year of the life of the individual offset

Borel's specimen flowered at Pezénas near Montpellier during 1641 and the then King of France with Cardinal de Richelieu and the whole Court went to view it This climate is that in all Europe perhaps most congenial to the Agaveæ and in the adjoining Sub Pyrenean County of Roussillon more especially about Perpignan an Agave is naturalized on a great scale (*Le Grand in Bull Soc de France XVII p 95*)

Bock (*Tragus*) about 1552, and *Mattioli* in the 1563 edition of the *Kreuterbuch* make no allusion to any plant that could be an Agave or Furcræa, though they deal fully with "*Aloe*," but in *Camerarius'* edition of the *Kreuterbuch* (*Frankfurt am Main*, 1590) *Aloe americana* is described and two illustrations are given The letterpress is taken from *Cæsalpinus* and *Clusius* almost bodily, but it is expressly noted that the plant had come to North Europe from the West Indian Islands, though the usual identification with the Metl of the American Continent is added One of the figures appears to be copied from *Clusius*, with an addition which will presently be noted The other shows a flowering Agave in a gardener's "tub," which might be almost any of the Enagave section This was sent by a correspondent in Italy to show how the American Aloe "poled" in Tuscany.

Camerarius boldly considers to be one Clusius plant of Spain and Netherlands Tuscan plant, and Linnaeus A americana

The addition to the figure borrowed from *De Lecluse* represents the terminal spine of an Agave which can only be that known in English gardens now as Agave americana A flower is figured in the margin of the Florentine drawing, which was probably meant to be of the natural size, but this does not agree with either of the species which we suppose to

have been up to that time introduced into South Europe Camerarius has helped a good deal, we think, to perpetuate the general assumption that the Agave which has been long cultivated in N Europe (Agave americana of *Lingaeus*) is the same species as that which has run wild on the Mediterranean littoral

AGAVE SPREADS IN EUROPE

Kaspar Bauhin ("*Pinax, etc*" *Basel, 1671, p 286*) gives under *Aloe* (1) *Vulgaris*, (2) *Aloe folio in oblongum aculeum abeunte*, quoting for the second *Aloe americana* of *Clusius* and *Aloe alterum genus* of *Cæsalpinius* Up to this time authors were contented to distinguish what we now call Agave from the true Aloe, and when further kinds began to be discriminated the definitions did not aim so much at sorting out the species under either genus, but referred to "*Aloe vulgaris*" as the point of departure, which has led to no little difficulty and misunderstanding

K Bauhin quotes a work by Linschoten on the East Indies (which we have not been able to consult) for his second *Aloe* but it appears from other sources that Linschoten saw or heard of that *Agave* in Africa or the Atlantic Islands

The earliest reference to Agave in the East Indies that we have traced occurs in a book which professes to contain notes by a pupil of *Boerhaave* of lectures delivered by that acute student of nature towards the close of the 17th century at Leyden This indicates that a species of Agave was by that time established in the Dutch East Indies where it was planted chiefly as a means of keeping out intruders *

AGAVE APPEARS IN THE EAST INDIES

From this work it seems that *Boerhaave* (who taught a system based in the main on an embryological foundation) placed the genus "*Aloe*" in his class of "*Monocotyledones bracteatæ*" and recognized in all six species, of which No 3 was the true *Aloe* from the island of Socotra (for which see *Bailey Balfour, Botany of Socotra, Edinburgh, 1888*) Nos 1 and 2 were also species of Aloe. From the virtues attributed to the fifth and sixth kinds they were evidently Agavse (or Furcræas) and American Of the fourth it is said—"*Quarta laudatur pro summo nutrimento in usus humanos, uti incolae testantur circa Mekiam, crescit in ingentem altitudinem folia rigidissima habet Hae pro muris in propugnaculis inserviunt*"

First in the spice islands.

* *Calvano* (v sup) makes no allusion to any Agave as introduced in his time into the E Indies

AGAVE APPEARS IN THE EAST INDIES

arcendis praedonibus, totum folium spinosum & filamentosum est nostralibus Naeldendraet, succus ex calice est edulis et nutrit ut rapa"

Mehia or Makian is a volcanic island about half a degree north of the Equator in 127° E Long,—the most southerly of the Ternate group, the original Moluccas or Spice Islands In 1605 the Dutch expelled the Portuguese from the Moluccas, and in 1664 the Spaniards who had occupied Tidore surrendered that also In the meantime the colony on Makian had been destroyed and scattered by a great eruption and earthquake in 1646, but the island was reoccupied after a few years, only to be laid waste again some twenty-five years later. We know that there were two ports on the South Sea coast of New Spain for trade with the Philippines and Moluccas, and that ships were built at one of these expressly for the South Sea navigation so that plants from Mexico might easily find their way to the East Indian Archipelago in the 17th century, but it is remarkable that *Valentyn* (*"Amboyna," Dordrecht, 1726*) makes no allusion to the **Agave** though he includes in his List of native and cultivated Trees and Plants the *Lidah Boaya* (i e Alligator's Tongue) or true Aloe.

Rumpf (*Herb Amb V p 271—274, tab XCIV*) gives a full account of *Lidah Boaya* as *"S mpervivum majus indicum"* which he introduced into *Amboyna* in 1661, and notes that it differs from the *Aloe americana* of *Clusius* 'that being more akin to *Pandanus*' *"Sempervivum,"* it may be noted, was a name applied, it is said, to the true Aloe by the traders of Antwerp, who often kept a plant hanging from their roofs as a curiosity.

Burmann—the editor of the *Herb Amb*—adds a later note by *Rumphius* dealing very fully with another succulent plant that was first brought to his notice in a deserted plantation (near Amboyna apparently) in 1697, but was spreading in the Colony The natives called it *Aanas utan*, i e 'woodland (or wild) pineapple,' or *Nana boaya* (Bwaya = crocodile in the Malay lingua franca, *v Crawfurd*, etc) and said that it had been introduced from Macassar—*Rumpf* compares his plant, of which the figure as regards the general habit is excellent, with the *Aloe americana* of *Clusius* which he knew only by description, noting at the same time that there are discrepancies between his living plant and the description which may be due to climate or casual variation

The note concludes by remarking that the plant seems to multiply by proliferous gemmation (i e, from what he calls the second sort of flowers or false blossoms) or by suckers or in either manner, but his observations could not be completed, for which he gives reasons

AGAVE APPEARS IN THE EAST INDIES

Rumpf's plant we consider is an Agave that is established as a denizen in India, and is markedly distinct from the species naturalized in S Europe, as well as from the true Agave americana of *Linnaeus*, namely **(E)** of our Descriptive List—A Cantala, Roxb

This plant not the same as those then in Europe

We must now return to the "American Aloe" in Europe *Hermann*, Professor of Medicine and Botany at Leyden, in his Catalogue of the Botanic Garden there (1687) enumerates five species of *Aloe* of which three are true Aloes, one is the "*Aloe folio in oblongum aculeum abeunte*" of *K Bauhin's Pinax*, while the fourth from the figure (at p 17) is an Euagave which he describes and calls *Aloe americana sobolifera* It was brought from America and flowered in a private garden at Harlem shortly before the compilation of the Catalogue

KNOWLEDGE IN RAY'S TIME

In the *Historia Plantarum* (*Lond typ Maria Clerk, 1688, pp 1195—1201*) *Ray* describes four species of the true *Aloe* He then deals with *Aloe americana* and distinguishes,

Ray's enumeration

(1) *Aloe americana*, Clusius
(2) *Aloe americana minor*, Munting
(3) *Aloe serrata major umbellifera*, Munting
(4) *Aloe purpurea laetis*, Munting
(5) *Aloe brasiliensis* (=*caraguata*) Markgraf

Three species of *Caraguata* (all of Markgraf*) follow, and the chapter concludes with

(6) *Aloe ferox*, Munting

Ray's succeeding chapter discusses certain species described by *Hernandez* (v supra) under Mexican names which *Ray* considered (though not without doubt in some instances apparently) to be referable to the group (so to speak) of *Aloe americana* Two of these had been included in the previous chapter (VII)

Before discussing the identity of *Ray's* species it will be convenient to refer to certain other authors mostly his contemporaries *Plukenet* (London 1696)

* We have not made extracts from the works of *Piso* and *Markgraf* (*ed De Laet Amsterdam ap Elzevir 1658*) because all that is important in their writings can be traced in works ordinarily more accessible

AGAVE APPEARS IN THE EAST INDIES

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(*a*) is a true *Aloe*, and (*d*) a *Tillandsia* or allied *Bromeliacea*

(*b*) should be *Agave americana* of *Linnaeus*, because *Kaspar Bauhin, Clusius* and *Cæsalpinius* are cited for the species, but its identity with the Mexican "Metl" or "Manguei" is questioned, very full references being given to the Spanish and English authors, who had dealt with the "Metl" AGAVES DISTINGUISHED ABOUT RAY'S TIME

The local name of the Jamaican plant is given as "Caraca," and it is said to be frequent on the stonier and drier hills of that island

Several accounts of "Caraguata" are referred to also, and we may say at once that "Caraguata" or "Keratto" is a comprehensive name locally applied in different countries to different Agaveæ, though usually, perhaps, to certain species of Furcræa but in S America to sundry Bromeliaceae also Keratto a loose term

(*c*) is identified by *Sloane* with the Henequen of older travellers, and he suggests that it may be one of the "*deux dernieres pites qui n a des petits picquans aux feuilles comme l'ananas*" mentioned by *Du Tertre*, as well as the "Pati *seu* Metl lenissimum" of *Hernandez* Of this he says "*ad margines viarum Insulæ Jamaicæ locis campestribus et sylvosis crescentem observavi*" *Martius* (l c) observes that the name "Henequen" belongs to the ancient language of Haiti, and was applied in the Antilles indiscriminately to different species of Furcræa and Agave, the corresponding Carib term being "Pita." There are other grounds for thinking that the Sisal Agave had been already naturalized in the West Indies before its recent re introduction, and on the whole it seems likely that the Pati of *Hernandez* and *Sloane's* Henequen represent Agave sisalana, *Perrine*

Towards the end of the same 17th century the *Commelins*,—*Jan* and *Kaspar* (uncle and nephew)—were successively in charge of the Amsterdam Garden, and published tracts on different species of Agave, the most important for the present purpose being the younger *Commelin's* Excursus in the *Præludia* (*Leyden, 1703*) on a species which he describes and figures as *Aloe americana polygona*, and identifies with *Munting's Aloe americana minor* which is Ray's No II By the Commelins

Commelin, relying, as we suspect, on *Ray*, or perhaps *Munting*, who were in their turn influenced no doubt by the drawing in *Hernandez*, says that his plant is the *Theometel* of

AGAVES. RAY REVIEWED. the Spanish author *Mr. Baker* (*Gard Chron 1877, vol. VII, p. 200*) keeps up an Agave Theometel, *Zuccagni*. *Zuccagni* identified his species with the *Theometel* of *Hernandez*, but *Mr. Baker* remarks that it may be a mere variety of A. americana *Linn*

Ray's first Euagave is A. americana. Returning now to the *Historia Plantarum*, *Ray's* first Euagave is clearly A americana *Linn.*, and his second we may take as = A Theometel of *Zuccagni* In his account of the uses of the first he has not escaped the general confusion, and attributes qualities to the A americana of N Europe gardens which it cannot claim, but the species that he meant to indicate was that which *Linnaeus* afterwards named "*americana*," although *Clusius* is cited

His second apparently is A Theometel

His third is no Agave. The third kind of this group rests on a description which seems to be quoted from *Hermann* but is not to be found in the *Paradisus* or the *Catalogue* This description answers to the woodcut of the "Maguey" in *Hernandez*, which as already said cannot be an Agave

Boerhaave (*Catalogue of Plants in the Leyden Garden* 1720) does not refer to it, and from the flowers it cannot be *Hermann's* "*sobolifera*" with which *Plukenet* and others have identified it

His fourth is apparently A Sisalana. There remains the *Aloe purpurea laevis* of *Munting* of presumed Agaves As already said we think this must have been Agave sisalana *Perrine*, though the purple tint ascribed to the edges of the leaves would fit Sansevieria better; as it happens, however, the leaves of the bulbils in A. sisalana as well as the species H of our descriptive list are spotted with violet-purple, which we have not observed in any other Euagave.

His first Caraguata and second seem Agaves of section Littaea. The *first Caraguata* (*aloe brasiliensis*) seems to be an Agave of the *Littaea* group; and the second may belong there also

His third probably a Furcraea. The third (*caraguataguaçu*) has been usually supposed to be a Furcræa and is probably = Furcræa tuberosa, *Aiton*.

His fourth a Bromeliad. The *Caraguata açanga* manifestly belongs to the Bromeliaceae and is doubtless, as observed by *Ray* himself, the *Mexocotl* of *Hernandez*.

AGAVES OF LINNAEUS. In the *Hortus Cliffortianus*, 1737, *Linné* describes certain species of *Aloe* (out of which, as before, we exclude all but those belonging to the tribe or natural order of Agaveæ) as follows:—

1 *Aloe foliis lanceolatis dentatis spina cartilaginea terminatis radicalibus* [Synonyms] *A folio in oblongum aculeum abeunte* Bauh Pinax [Morison's tab 22, f 2 and 3 are also cited, of these fig 2 is that of *Clusius* without the addition made by *Camerarius*] *Aloe secunda, etc*, Sloane, *Aloe americana muricata* Bauh Hist, [and] Boerhaave, *Aloe americana* Besl Eyst, *Aloe alterum genus ex India occidentale* Caesalp Syst 418 *Caraguata guaçu* Markgr Bras 87 [A variety is given as *Aloe americana ex vera cruce foliis latioribus et glaucis* Comm hort 2 p 31 t 16,—and the native country is said to be "*in sterilioribus aridioribus et saxosis colliobus americae jamaicae, etc*"] AGAVES OF LINNAEUS

* * * * *

13 *Aloe foliis lanceolatis integerrimis patentiusculis aculeis terminatis radice caulescente* [Synonyms] *Aloe americana viridi rigidissimo et fœtido folio Piet dicto indigenis*, Kiggelaar in Comm hort 2 p 35 t 18, Boerhaave Lugdb 2 p 129 n 10, *Aloe americana tuberosa fœtida major Pit Pita* Herm. Prod 306, *Aloe americana radice tuberosa minor* Pluk. Alm 19 t 258 f 2. [Native country] *Curaçao*

[A variety is described as *Aloe americana foliis angustioribus ex Vera Cruce Hort Carol 4*]

The figure cited under 13 from the Phytographia* is referred in the Almagestum (p 19 as cited by Linnæus) to *Aloe americana radice tuberosa fœtida major Pit Pita P B P* * * **Eadem minor non spinosa* which *Plukenet* identifies with *Aloe americana viridi rigidissimo et fœtido folio Piet dicto indigenis* of the Hort Beaumont but these identifications cannot be relied on and all that can be said is that *Linnaeus* Harlem plant was pretty certainly a spineless *Furcræa*

With respect to 1, it is a fair inference that *Linne* looked on the two distinct plants that are often included under *Agave americana* on the continent of Europe as forms of one species The two confused plants of Europe

We have not been able to inspect** the figure published by the elder *Commelin*, but there is every likelihood that the glaucous variety of Clifford's collection was the type known in the Calcutta Garden as *A lurida* and long supposed to be identical with the *Agave lurida* of Aiton's *Hortus Kewensis* This garden possesses plants received from the great collection of *Sir Thomas Hanbury* at *La Mortola* as *Agave lurida*, which appear to us

* What follows applies to the only copy to which we could refer:—the *Eadem minor non spinosa*' is what we should now call a subspecies, made by *Plukenet* himself

** Since seen; it is evidently *Agave lurida* H B C = A. Vera-Cruz, *Mill*

AGAVES OF LINNAEUS

His No 4

a synonym for his *vivipara* In the text of *Commelin* nothing is said of the stamens being equal to the corolla; and it is expressly stated that the *Aloe americana sobolifera* of *Hermann*, which *Linnaeus* excludes altogether but compares with his *vivipara*, is a totally different plant from the *polygona*

Commelin is positive that his *polygona* is the *Aloe americana minor* of *Munting* and his engraving corresponds with *Ray's* description (based on the *Aloidarium* presumably), but the further identification with the *Theometel* of *Hernandez* rests on the statement of a ship's captain who had brought the plant to Europe as a febrifuge with the native name *Theometel*, which *Hernandez* had rendered as "*Maguey divinum*"

Wight mistook it

Aloe americana minor, however, from the description would seem to differ from the plant which is figured by *Wight* (*Icones, 2024*) as naturalized in India and referred to the Linnæan "*vivipara*" *Wight's* species which is at once recognizable from other Euagaves, has a strong likeness to a rough sketch in *Hernandez*, but this is not his *Theometel*

Linnaeus thought Rumph's Amboyna plant his No 2

In the 2nd ed of the Species Plantarum, *Linnaeus* added as a further synomym for his "*vivipara*" *Aloe americana, Rumph 5 p 273 t 94* *Rumpf* did not intend apparently to identify his plant with that of *De Lecluse*, but in any case it is certain that they are perfectly distinct whether what *De Lecluse* saw was A americana of *Linnaeus* or another species If *De Lecluse's* drawing was taken from an offset, as is stated, it was probably = *A lurida H B C*, but it is difficult to separate young plants of this from true americana

Following the later editions of the *Species Plantarum*, the real plant of *Rumpf* has been often called *Agave vivipara*, especially in the East Indies

Dillwyn made Sherard's plant to be Linnaeus No 1?

In the *Hortus Elthamensis (Amsterdam 1774) Dillwyn* figures a plant in *Sherard's* garden (in England) which is styled on the plate *Aloe barbadensis mitior laete virens et splendens'* in a List in which the plants are harmonized with the *Species Plantarum* this is reduced to *Agave americana* of Linnæus.

If the identification be correct and the specimen came from Barbadoes this would shew that the true americana " was then in the West Indian Islands, but the drawing is indifferent

JACQUIN'S A LURIDA

In the fourth volume of the *Collectanea* (*Vienna, 1790, p 94 t 1*) *Jacquin* figured and described his *Agave lurida*, which he identified with a species published under that name in the *Hortus Kewensis* of *Aiton* (*1st ed, London, 1789*), at the same time stating that it was well known in Botanic Gardens as the

Aloe ex Vera Cruz, but had flowered for the first time at Schonbrunn, where it had been received in 1753 from Holland

JACQUIN'S A LURIDA

The description does not quite fit any **Euagave** with which the writers are acquainted, the coloured figure shews a plant* which, whatever it may be, is not **A americana**, *Linn*, nor *A. lurida* of the *Calcutta* Garden It may be presumed that the *Vera Cruz Aloe* of gardens was either identical with the *Aloe ex vera cruce*(1) of the *Hortus Cliffortianus* or was so far like it that the two were identified *Aiton* (*in the 2nd edition*) does not say that his *Agave lurida* was the *Vera Cruz Aloe* of *Miller*, but he quotes *Willdenow* who took his *A lurida* from *Aiton's* 1st edition and *Willdenow* gives two varieties, of which *foliis latioribus* is expressly said to be the **Agave Vera Cruz** of *Miller*. *Willdenow* arranged his **Agaves** under two groups—*Acaules* and *Caulescentes*,—*lurida* being in the latter

Willdenow thought this conspecific with A Vera Cruz

Turning now to *Miller* (*Gardener's Dictionary, VIII ed*) who, though he made full use of the Linnæan genera, adhered in the main to *Ray* and *Tournefort*, we find three **Agaves** of the Species Plantarum, viz —

MILLER'S EIGHT AGAVES

1 *A americana* 2 *A fœtida* 3 *A vivipara*

He had No 3 in cultivation and describes it as *foliis reflexis marginibus dentatis*, and identifies it with the *Aloe sobolifera* of *Hermann* without hesitation, though *Linnaeus* was doubtful and *Commelin* says flatly that they have nothing in common *Willdenow* had concurred with *Commelin*, at the same time questioning *Linnaeus'* citation of *Rumphius*

His vivipara is not Wight's Indian vivipara

We may say at once that the *Agave vivipara* of *Miller* must be utterly distinct from the plant of *Wight's Icones*

Miller's second species is *Agave* (*virginia*)† which is altogether different from *Linnaeus' A virginica*

The following plants not known to *Linnaeus* are common to *Miller* and *Aiton*—

Gard. Dict		*Hort Kewensis (2nd ed)*
(1) *Agave tuberosa*	=	*Furcræa tuberosa*
(2) *A Karatto*	=	*A americana B foliis margine fuscis*
(3) *A rigida*	=	*A lurida B foliis angustioribus*

* The capsule and seeds are those of **A Wightii** *nobis*, which would seem (from *Schiede*) to occur near *Vera Cruz* in plenty

† It was sometimes quoted '*virginica*' following a mistake by **Martyn** in Vol I Pt I of the "*Gardener's and Botanist's Dictionary*," London 1807.

MARTYN ON AGAVE. With *Agave* (*virginica*) this makes seven species *Miller's* eighth and last is *Agave* (*Vera Cruz*) which from his description is *Agave lurida H B C*, or a very closely allied species

Sherard's plant at Cambridge. In the tenth Edition of the Gardener's Dictionary (*edited by Thomas Martyn London 1807*) in which there are numerous alterations there are a few notes of

Possibly two Agaves were then in England. a true Agave americana *Linn* Again Mr Cowell flowered an Agave in 1729 at Hoxton about which there was controversy the owner maintaining that specimens flowered in England previously were not the true great American Aloe which suggests that there* was at least one other species of the Agave—Furcraea group then in cultivation The third note is worth extracting

Hedges in S Europe. '*There are now hedges of the common Agave in Spain Portugal, Sicily and Calabria it flourishes also about Naples between Villafranca and Monaco and in other parts of Italy* But the common Agave of the Mediterranean is the *lurida* of the Calcutta Garden

WHAT IS W INDIAN SO CALLED A AMERICANA. We have seen that *Linnaeus*, for the sake of brevity perhaps, omitted the Jamaica habitat for his Agave americana from the Species Plantarum while *Sir Hans Sloane* has given what should be the same plant as a native of stony barren hills in that island, stating that the local name is *Curaca*

Dr Patrick Browne in his "*History of Jamaica*" (*London, 1789*) states that an Agave is indigenous and common in Jamaica the name is *Corato* or *Curaça* He gives several synonyms, of which one is the Linnean description of "*A vivipara*" with the specific designation omitted, but no weight can be attached to these citations because *Bauhin's* species, which is the A. americana of *Linnaeus*, is included, to say nothing of the *Aloe sobolifera* of *Hermann* *Grisebach* (*Flora of Br W Indian Islands, London, 1864, p 582*) quotes *Browne* for the occurrence of Agave americana *Linn* in Jamaica He also notes that he has seen specimens from Antigua and (naturalized) from S Europe, and the E Indies As it happens, Agave americana *Linn*, is *not* naturalized anywhere in the

* In the '*Figures of Plants*' (*London 1760 Vol II p 148 Plate CCXXII*) which were designed to illustrate the earlier editions of the 'Dictionary,' *Miller* has given an Agave that flowered at the Chelsea Garden during 1757 *Martyn* says this was a mere variety of *A americana* which does

discrepancies

East Indies *Grisebach* no doubt had seen Herbarium specimens labelled "*A americana*," but belonging to another species He observes that no other Agave occurs in West Indian collections, but refers to the *A Antillarum* of *Descourtilz* comparing it with A sobolifera of *Salm-Dyck*, which that author understood to have come from Haiti and Jamaica W INDIAN SO CALLED A AMERICANA

A sobolifera of *Hermann* seems to be a well marked species, it is figured* by *Lamarck* (*Encyc Méthod que, Pl 235, fig 1*) as *A. vivipara, L* '*A americana, Rumph*,' is quoted as a synonym, and *Commelin* (*Praeludia*) is also cited *Lamarck's* plant is said to occur in San Domingo (*i e* Haiti) and Jamaica It seems likely that the account of *Browne* relates, in part at least, to a Furcræa, and that this led authors to refer to the *Agave vivipara* of the Species Plantarum, which had stamens not exceeding the corolla On the other hand both *Browne* and *Descourtilz* lay stress on the conspicuous yellow colour of the blossoms, and it is quite possible that two or more species of Euagave are diffused in the West Indian Islands, one being *Hermann's* '*sobolifera*,' which seems to be very little known, if known at all, in England It may be confused with a second species

Lamarck is quoted for another book species which hardly admits of practical identification, viz, *Agave mexicana* (*Dict I p 52 and Encycl Meth I 241*) In either work the plant is said to be the Maguey of the Mexicans *Furcraea odorata, Persoon*, and *Agave cubensis, Jacq*, are given as synonyms which are = Furcræa cubensis *Vent* The *Encyc Meth* gives no description, and that in the *Dict* plainly indicates Furcræa, so that *Agave mexicana* falls to the ground as a species His *Agave americana* is evidently = *A lurida H B C*, as he says it was naturalized in S Europe, and he had seen living specimens Lamarck's A mexicana is no species His A americana is the A lurida of India

In *Roemer's Collectanea* (*Zurich, 1809, p 138, Tab I*) *Zuccagni* figured and described an Agave, which he identified with the *Tleometel* of *Hernandez* The description might be meant for the species figured by *Wight* in the Icones, but we hardly think, after full consideration, that they can be identical *Roemer's* main engraving is not very good and follows possibly that ZUCCAGNI'S A THEOMETEL

* The figure appears to be taken from Hermann

DESFONTAINES AGAVES

of *Commelin's* "*Aloe polygona*" (which is not cited, however), but the enlarged drawings of the flower do not match the Indian "*vivipara*" It is not stated whence this Agave was brought to the Florence Botanic Garden, where it flowered, and was described in 1806 by *Zuccagni*.

The List of Agaves in the *Jard n Di Roi* published at Paris by *Desfontaines* (1815) is as follows —

* (1) *americana L — var egata*
  (2) *lurida, Jacq Coll* } *mexicana* } *angustifolia*
  (3) *vivipara L*
  (4) *fœtida L*
  (5) *Manguai* } *bulbifera Bonpland* }
  (6) *yuccæfolia Red. Lil*
  (7) *spicata Dec Cat*

Nos 6 and 7 are well kn w spec es of a different group from the Euagaves, with wh ch al ne we are so far concerned in India No (4) is a Furcræa so most probably was No (3) — No (1) was evidently true Agave americana *Linn* *Desfontaines* must have seen the naturalized Agave of S E rope and N Afr ca and as he doubted the identity of h s No 2 with the *lurida of Jacqu n* it was very poss bly = *A lurida H B C*, i e, *Aloe americana of Clus us* The suggestion that it was the *A mexicana'* which the bracket im plies supports this

SUMMARY OF AGAVES KNOWN A CENTURY AGO

In the beginning of the 19th century, therefore, it appears that the following species of Euagave and Furcræa were known to science, viz —

Agave (Euagave)

I Agave americana *Linn*

Origin unknown, cultivated as an ornament in the gardens of Europe

II Agave Vera Cruz *Miller*

Introduced from Mexico, probably the *Aloe americana* of *Clusius*† naturalized in S Europe and N Africa (= *A lurida H B C*)

* The number ng is ours

† Hb. H B C possesses a spec men from Xeres in S Spain collected by F Bourgeau (No 469) named *A americana* by *Cosson* which is identical w th the *A lurida* of the Calcutta Garden This No of F Bourgeau is quoted by *Nyman* (*Consp Fl Europ*) for A americana, Linn., which he gives as natural zed along the shore and in the islands of the Med terranean

The figure (98) of *A americana* in *Baillon Hist des Plantes, XIII* 16 is a fair portrait of *A. lurida H B C* part cularly as regards the inflorescence The enlarged sketch of the flower is dec s ve

SUMMARY OF AGAVES KNOWN A CENTURY AGO

III. Agave Theometel *Zuccagni*,

Native country doubtful, probably the N.-W. of Central America; flowered at Florence, 1806, or earlier;

not = *A vivipara, Linn*

nor of *Lamarck*

nor of *Schultes Syst. VII. p. 717*

nor of *Kunth Enum. V. p. 823*

nor = *A vivipara* of *Wight Ic. 2024*

perhaps = *Theometel* of **Hernandez* (*Anton. Recch. VIII. p. 274*)

IV. *Aloe sobolifera* of *Hermann*,

Native country doubtful, perhaps the Antilles and = A. sobolifera *Salm-Dyck* (*Kunth Enum. V. 822*)

V. *A. lurida, Jacquin* (*Collect. l c*),

Native country unknown;

not = *A. lurida, Ait.*

nor = *A lurida, Gawler* (*Bot. Mag —1522*)

nor = *A. lurida, Baker in Saunders' Refugium* (*V. 307*)

nor = *Aloe americana, Clusius*

nor = *A lurida H.B.C.*

VI. *A.* (*species*) (sub "*Sempervivum majus.*") *Rumph. Herb. Amb.* (*ed. Burmann, p 273 t. 94*)

Native country unknown, introduced before 17th century to Amboyna; probably = *Naelden-draet* of Dutch settlers in Moluccas mentioned by Boerhaave;—

not = *Aloe americana* of *Clusius*

nor = *A. americana, Linn.*

nor = *A. vivipara, Linn.*

nor = *A. vivipara, Lam.*

nor = *A. vivipara, Wight*

but = *A. Cantala. *Roxb*

* *Pr V. Salm-Dyck*, who appears to have suggested that Rumph's plant was a Bromeliacea, had probably never seen A. Cantala *Roxb.*

SUMMARY OF AGAVES KNOWN A CENTURY AGO

VII *Aloe Yuccæ folia* of Sloane, *Cat p 118* in part
= *Henequen* of *Oviedo*
= *Pati seu Metl lenissimum* of *Hernandez* (*Ant Recch p 275*)
Native country unknown, cultivated and naturalized in the Caribean region,—perhaps = A sisalana, *Perrine*.

VIII *Quetzalychitl quem alii Metl Pitae vocant* (*Hernandez l.c.*)
Native country unknown, cultivated in Central America If this was a Euagave it is possibly = our A Wightii

*IX A Keratto *Miller* (not of *Salm Dyck*)
Native or naturalized in the island of St Christopher
(We have excluded from this list of Agaves all forms that we refer to Furcræa as also a few the identity of which is at present hopelessly involved and doubtful)

Furcræa

1 F. gigantea *Vent.*
Native country unknown, cult and naturalized from Central America and the Caribean region to Northern Brazil

2 F. Commelynii *Salm-Dyck*
= *Aloe americana tuberosa minor* of *Comm Hort Amst 2 f 19 (f Salm-Dyck)* (*v Kunth Enum v 842*)
Native country doubtful

3 F. tuberosa, *Ait.*
= *Agave tuberosa, Mill* (*excl A Commelynii f Salm-Dyck*) native or cultivated and naturalized (?) in West Indian Islands

4 F. cubensis, *Vent*
= *Agave cubensis Jacq* (also *Willd*)
= *Agave mexicana, Lam*
Native country unknown,—naturalized in the Caribean region and introduced in S America

It thus appears that with scanty exceptions the original home of these forms of Agaveæ is not satisfactorily established,

* *Agave rigida* Miller is excluded as its identity is altogether doubtful

while at least three kinds (all of Agave) that had been described by pre Linnean authors remain unidentified The localities mentioned in the old books give no certain clue, because the writers did not distinguish between native species and those naturalized or even between wild and cultivated forms

HOMES OF THESE AGAVES

Agave americana is believed by *Martius* (*Fl Brasil III P I p 187*) to be a native of high mountains in Mexico, but his authority is not given and the plant was probably a different one Furcræa tuberosa *Ait*, is reported by *Seemann* from the slopes of Chiriqui, a volcano on the borders of Panama and Costa Rica (*Hemsley Biolog Central Amer* Bo app. p 273) A statement by another traveller is quoted for the occurrence of *Agave americana* wild in the same belt on Chiriqui at 4,000—8,000 feet above sea level, but *Mr Hemsley* thinks that the Furcræa may have been mistaken for it We think there can be little doubt of this, and further that the Maguey cimarron (*i e* wild maguey) seen by *Schiede* and *Deppe* in the "regio frigida" of Mexico Proper, whatever it may have been, was not true A americana (*Linnaea IV 581*) The very circumstance that the Mexicans distinguish the mountain sort as wild shows they are well aware that *"die allbekannte A americana,"* as *Dr. Schiede* styles the Pulque Agave, is unknown except in cultivation.

Pulque Agave only in cultivation

The first account we can trace of any Agave in India Proper is in a series of papers by *Dr W Roxburgh* which exists in two forms, one of these pamphlets was printed officially, the other appears in the XXII Vol of the transactions of the Society of Arts of London 1804 (which voted its thanks to the author), under the title "*Observations on the culture properties and comparative strength of Hemp, Sun, Jute, and other vegetable fibres the growth of India*"

LITERATURE ON AGAVE IN INDIA

Roxburgh.

In a comparative statement appended with the "*Observations*" we find '*Agave americana*" given as No 11 of the staples on which *Roxburgh* had conducted experiments

In the official correspondence the same plant is described as a new *Agave*, in both it is referred to as found wild in plenty, though where is not stated, and there can be no doubt that the species is that afterwards described in the *Flora Indica* (*Ed C. B Clarke p 296*) as A. cantula

LITERATURE ON AGAVE IN INDIA

In the *Hortus Bengalensis* (*Serampore, 1814*) three Agaves are shown as cultivated in the *Calcutta* (*Sibpur*) Botanic Garden, viz —

(1) *A* Cantala R.* (2) *A lurida* (3) *A tuberosa*

Roxburgh gives origin of three species

No (1) is noted as introduced before 1794 from India, and as having a Sanscrit name which would now-a-days be transcribed as "*Kantala*" No (2) is said to be a native of America, (date of introduction not given) A footnote states that No (3) had been received from Kew, but that the species was then already in the Garden (from America 1799) under the name of "*Yucca superba*"

Voigt takes up wrong names for one

In the *Hortus Suburbanus Calcuttensis* (*Bishop's College, 1845*) there is no *Agave Cantala*, but a *Fourcroya Cantula* of *Haworth* appears as synonymous with the "*Agave Cantula*" of the *Flora Indica* The Bengali name is given as "*Bilati Ananas*" and the source, doubtfully, as the Moluccas or S China *Graham* (*Cat Bombay Plants*, *p 272*) is cited, also *Rumpf* (*l c*) the usual error being admitted as to *Rumpf* having called his plant "*Aloe americana*"

What *Rumpf* said was that the Amboyna "*Aloe*" was a very different vegetable from the true *Aloe* or "*Sempervivum*" (Lidah Boaya) and was manifestly *akin* to *Clusius' Aloe americana*, the differences being due perhaps to soil and climate

We have not seen the original** work of *Haworth*, but his transfer of *Roxburgh's* "*Cantula*" to *Furcraea* was pretty surely an error. *Voigt* (*Hort Suburb l c*) further gives "*Fourcroya tuberosa*" (no doubt the '*Yucca superba*)" and two Agaves, viz, 1 *lurida Ait* 2 *Vera Crucis Haw* He says expressly that his "*lurida*" is that of the *Hortus Bengalensis* The first edition of *Aiton's Hortus Kewensis* issued in 1789, so that it is possible that *Roxburgh's* "*A lurida*" was named with reference to that work, but it does not follow that the Calcutta plant and that of Kew (which appears to be extinct) were identical

He has two other—gone A lurida as above the other A. Vera Crucis introduced 1836

As regards the *A Vera Crucis Haw* of *Voigt*, there is happily a clear record A note by *Wallich* in the unpublished records of the Sibpur Herbarium shews that this was introduced

* The name as spelt in the Hortus Bengalensis has priority and the species is therefore A. Cantala, Roxb not *A Cantula* as in the Flora Indica.

** Since seen: the emendation was gratuitous, Roxburgh's plant is a true Agave

LITERATURE ON AGAVE IN INDIA

Was Roxburgh's lurida different from Vera Cruz?

from the Chelsea Garden by *Lord Auckland* during 1836, and was looked on by *Wallich* as doubtfully distinct from the existing "*lurida*" There can be little question that the plant *Haworth* meant was *Miller's* "*Vera Cruz*" *Agave*, and this presumbly is the *Vera Cruz* variety of the *Hortus Cliffortianus* also, that it is the present "*lurida*" of the Calcutta Garden we consider certain What the "*lurida*" of *Roxburgh's* day may have been remains to be seen, if indeed we are to think that it was distinct from the "*Vera Crucis*" of the *Hortus Suburbanus*, but it certainly was not "*Cantala*" *Roxburgh's* "*Cantala*" seems to have been lost between 1840 and 1847, at which period extensive alterations were in progress. There is a Catalogue of 1847 (which is however probably not exhaustive), in which no Furcræas are shown, and only two Agaves, viz, *A americana Linn.* and *Vera Crucis Haworth.* The "*americana*," if it was the true *americana* of *Linnaeus*, must have been a recent introduction, because this is included in *Voigt's* list of garden desiderata

The next after *Roxburgh* to observe an Agave naturalized in India was *Dr. Francis Buchanan* (afterwards *Hamilton*).

The following is from the "*Journey*" (*London 1807, p 36*) [march of 6th May 1800, Baydamangulum to Tayculum]

Buchanan Hamilton found planting of an Agave going on in Mysore

'*The natives here plant also many aloes* (*Agave vivipara*) *in their hedges and use the leaves for making cordage It forms a strong defence against both man and beast, and thrives better in the arid soil of Mysore than in any other place that I have seen ;—its Canarese or Karnataca name is Ravana Meshid*"

There is nothing to shew why *Buchanan* named his plant (which is pretty certainly the same as *Wight's*) *Agave vivipara*, but most likely he was led by *Linnaeus'* citations in the *Species Plantarum*

Moon had 3 species in Ceylon

Moon's Catalogue (*Colombo, 1824 p 25*) gives as growing in Ceylon *Agave americana, A lurida*, and *Furcræa tuberosa* No authorities are cited but as the English name of "*lurida*" is given as '*Vera Cruz*' (Aloe) the species doubtless was = *A lurida H B C* What Moon's *A americana* may have been, we cannot say, and the same applies to records from the Mascarene Islands, from the Cape of Good Hope, and Saint Helena also A St Helena plant cultivated in the Botanic Garden at Buitenzorg (Java) has been described as a distinct species by *Haworth* under the name of *A angustifolia*

Naturalisation in Africa.

In the Flora Capensis (*Stuttgardt, 1823*) *Thunberg* mentions "*Agave americana*" as naturalized on Table Mountain, etc

Certain *Agaveæ* have been long naturalized in the Mauritius *Mr Baker* (Flora of Mauritius 1877) shews *Agave americana* and *Furcraea gigantea* as established A *Furcraea* known as '*Mauritius Hemp*' is grown in parts of Southern India

LITERATURE ON AGAVE IN INDIA

Graham found one species at Bombay

In his *Catalogue of the plants of Bombay and its vicinity*, *Graham* has the following —"*1572 A Cantula Roxb Flora* "*Ind 2 p 167 Aloe americana Rumph Hort Amb 5 t 94* "*A stately Aloe looking plant, the central scape rising to the height* "*of 16 to 20 ft, flowers in rains in gardens, Bombay, Seroor* "*There is a variety with long flexuous leaves The seeds germinate* '*in the capsules before they drop off, as in A vivipara*"

The common Agave of to day in hedges near Bombay and Poona is a plant which we identify with *Rumpf's* figure and with *Roxburgh's* 'Cantala' It seems doubtful if there are specimens of this from the New World in European collections, unless it be *Agave laxa* of *Zuccarini* (for which see *Baker* in *Gard Chronicle Vol VIII 1877 p 780, figure 151*) *Mr Baker's* figure is not unlike a form that is common in hedges at Saharanpur (in the Agra Province) This form was referred by the late *Mr Gollan* to an Agave that is identical with specimens recently collected in the Bombay neighbourhood, which we refer to A Cantala

Species at Saharanpur in 1855

The Saharanpur Catalogue of 1855 shews the following,—*A procumbens A tuberosa A cantula, A americana, and Littaea geminiflora* The last named is an Agave of a different section from the Euagaves, and for our purpose negligible The "*A tuberosa*" was probably a Furcræa which is still represented in the Garden though not naturalized anywhere in N India "*A americana* probably covered A americana, *Linn* (cultivated in the Garden solely) as well as a quite different species which has run wild in waste places and hedges through the whole Civil Station On what authority we have not been able to discover, the second species has been called "*A lurida*' at Saharanpur for some time past To this Saharanpur "*lurida*" (which is *not*=*lurida H B C*) the natives give the name of "*Rámbansheora*' to distinguish it from the ordinary "*Bansheora*' which at Saharanpur is usually applied to Wight's *A vivipara*

In *Dr Jameson's* Catalogue *Bansheora* is appropriated to his *Agave procumbens*" but this is possibly a slip If however the vernacular name was deliberately restricted to *A procumbens* then *A procumbens* was most likely meant for Wight's *vivipara* the allusion being to the way the trunk often lies along the banks of ditches and other sites where *vivipara* luxuriates particularly near the old Rohilla fortifications

If *procumbens* was=*vivipara* (Wight) then *A cantula* must have been Roxburgh's species

The *Agaves* now existing in a naturalized condition in and about the Saharanpur Garden are as follows,— AGAVES NOW AT SAHARANPUR.

(*i*) *A vivipara* (*Wight*)

(*ii*) *A Cantala* (*Roxb*)

(*iii*) *A* not named, (believed by Mr Gollan to be merely a form of the preceding) may we think be the same as *Graham's* "flexuous" variety of A Cantala It seems to have everywhere a poor reputation as a fibre plant, which is not the case with A Cantala proper This unnamed form has a weedy habit, the outer leaves often bending over almost from their point of origin

(*iv*) "*A lurida*" (Saharanpur)

A Cantala is said to be widely spread in the Dehra Dun, and to extend to the outer* Himalaya, where it is used for hedges, but further enquiry is called for as to this, because it has not been always distinguished from another Euagave of which the Calcutta Garden possesses specimens descended mostly from seed sent by *Mr J S Gamble, F R S*, from the Dehra Dun some years ago under the name of "*A mexicana*" Fibre was manufactured in the Dehra Jail formerly from a naturalized Agave described in accordance with the ordinary practice as "*Agave americana*" It is doubtful if fibre has been ever made, save as an experiment, from the true A americana of *Linnaeus*, which does not exist in the Dehra Dun, or anywhere else in India for that matter, so far as we know, in sufficient quantity DIVIDED OPINIONS

The difficulties that confront the student in dealing with the Agaveæ are well illustrated by the case of *Roxburgh's* species *Mr. Baker* (*Gard Chron 1877, Vol VIII p 780*) refers *A Cantula* of *Roxburgh* to *A vivipara* of *Linnaeus* "*at any rate as regards the synonym Rumph Amb Vol V p 273 tab 94*" and at the same time cites the *A vivipara* of *Wight* as another synonym His view has been followed, as the best authority then available in *Kew Bulletin No 39, March 1890, CXXXV* (Bombay Aloe Fibre) He further identifies *A Cantula* with *A Rumphii, Hassk* (*Cult Hort Bogor*) which purports to be the plant figured in the *Herbarium Amboinense* *Rumpf's* plate has often been taken for the plant figured by *Wight*, but on due examination of live specimens the The possibility of A Cantala being A Rumphii of Java

* To about 6 000 ft above sea level in the station of Mussooree

COMMENTS ON A CANTALA

resemblance vanishes. *Hasskarl* published his species in a supplement to "*Flora*" (*II 1842 p 6*) as follows —

Zollinger wrongly called the Javan plant A Cantala

"*Agave Rumphii mihi Acaulis foliis lineari-lanceolatis, canaliculatis acuminatis spinis marginalibus nigris rigidis sursum arcuatis, scapo ramoso demum viviparo, staminibus corollam longe superantibus Corollæ limbo revoluto Ch. Sprg. S. V. II. 79— Willd Sp Pl II 195 Schlt VII 127 Rumph Amb. v 273 t. 94 Nom Sund Nannas sabrang=Bromelia transmarina.*"

He does not cite **A. Cantula** *Roxb.* as a synonym, and the revolute segments of the perianth of his description do not suit any species as yet observed in India *Zollinger* (*Syst Verz der in Ind, Archipel, etc, Zurich, 1854*) sets aside *Hasskarl's* name in favour of *Roxburgh's*, he had at least one specimen before him and had seen the plant of *Hasskarl* living in the Buitenzorg Garden In the latest Catalogue of that garden (*Teysmann and Binnendijk, Cat Pl H B Bogor, 1866*) *A Cantula Roxb*, is maintained and *A Rumphii*, *Hasskarl* excluded

In the Garden of *Sir Thomas Hanbury* at Mentone (*Syst. Cat by G Cronemeyer, Erfurt, 1889*) *Agave Rumphii, A. Cantula, A vivipara,* and *A Ixtli? Ixcometel* are all separately represented *Mr. Watson* of the Kew Garden visited the Riviera during 1899 (*Kew Bulletin No 36, Dec 1889, CXXVI*) and his notes on Agaves include the following

"*A Rumphii Hassk —Mr Baker refers this to 'A vivipara' but the plant under the former name in Mr Hanbury's Garden looks like a gigantic A rigida, it is a very fine* Agave, *the leaves about 5 feet long and very numerous*"

* * * * *

"*A vivipara Linn (A Cantula). A distinct species, more resembling a Furcraea This lately flowered at Mentone*"

Baker says A Cantula of Riviera is form of A rigida if so then Cantula of Riviera is not Cantala of India

In November 1891 *Mr. Baker* himself visited the Riviera (*Kew Bull No 61, January 1892, CCXXIII*).

We extract the following as it is material —

"*A rigida Miller This, the most valuable and most variable of all the Agaves, is common and quite at home in the Riviera Gardens, flowering freely, and I had an opportunity of studying its characters and range of variation far better than I had ever done before and of seeing several forms with which I was not previously acquainted The commonest forms in the Riviera show the characteristic small distant nearly black teeth, and agree very well with*

what has been described and figured as Ixtli and ixtlioides (Bot. Mag t 5893) In Dr Hern's garden, situated just on the French side of the Boundary Gorge at St Louis, I saw a form with leaves much thicker than usual (1½ inches thick at the base) and forming a less dense rosette The plants called Cantula and Rumphii in the Riviera gardens are forms of rigida Mr Hanbury has just flowered a spineless form that agrees very well with the sisalana of Yucatan and Florida I am quite satisfied now that A Houlletii, Jacobi, is nothing more than undeveloped sisalana, and the same holds good with a plant called laevis One panicle of this species at La Mortola was producing copious bulbillæ The peduncle, including the rhomboid panicle, does not reach a greater height than 12—15 feet The bract leaves, like those of americana, are small and distinct as compared with those of atrovirens" COMMENTS ON A CANTULA

If this decision be accepted it is certain that the plants named '*Cantula*," and "*Rumphii*" at La Mortola cannot be the plants of *Roxburgh* and *Hasskarl* respectively We possess in India specimens received from Kew as "*Agave rigida*" which differ absolutely from any species naturalized in the East Indies, and from *Rumphius'* figure also The reference to the picture and account of *A ixtlioides* in *Bot Mag 5893* complicates the question, for the plant there depicted,—after every allowance for the effects of artificial nurture,—could not pass as conspecific with the **Sisal Hemp** of India That the Indian **Sisal** is the plant introduced from Yucatan to Florida by *Dr. Perrine*, is certain, see among other authorities *Kew Bulletin No 62 of 1892, CCXXVII* (**Sisal Hemp**) and *Bulletin No 5, 1899, Dept of Land Records and Agriculture, Bengal,* (**Agave sisalana**)

A sisalana in India varies as regards its leaves from margins absolutely smooth to fairly thorny, but there is one **Sisal Hemp** in this country and one only Leaves with and without prickles may be found on the same individual

Royle and Wight had never seen A Cantala

To return to **A Cantala**,—*Royle* had evidently never seen an authentic example of this (1853), nor had *Wight*, who does not even mention *Roxburgh's* species. *Wight* (*Icones VI* pp 18 19) says—(under *Agave vivipara*)

"*The Agave americana or as it is usually called American Aloe, now so common all over the country, belongs to the same genus and, as the name imports, comes from the same country They are not Aloes. Rumphius has introduced a figure of this plant into his*

COMMENTS ON A CANTALA

Herb Amboynensis apparently on the supposition of its being indigenous in that island"

It is needless to comment on this passage in detail, but it is essential to observe that the plant with which "*Agave americana*" is being compared is the *Agave vivipera* (*sic*) of Linnaeus, and that it is for introducing a figure of Wight's own *Agave vivipara* that *Rumpf* is (unjustly as it happens) indited The passage seems to have been often read as if the plant of which *Burmann* added (from *Rumphius' "Auctuarium)"* a plate to the original account of "*Sempervivum*," was '*Agave americana*' Actually it is neither *A 'americana'* nor '*A vivipara'* (of *Wight*) but A Cantala Roxb

Burmann added plate of A Cantala to Rumpf's work for A americana and Wight took it to be his A vivipara which he thought also to be Linné's

Wight's illustration is not very good, but it cannot fail to be recognized by any one who is conversant with the Indian Agaves and it should be equally impossible to confound either the species itself or *Wight's* artist's drawing with the plate in *Rumphius* There is an unpublished drawing in the Herbarium H B C marked as *A vivipara, L* in Wallich's handwriting under which is written '*? A Cantula, Roxb*" The species is unmistakably that of *Wight's* figure, the more so that both represent plants which have blossomed, when the appearance of the rosette' or bunch of leaves (which in "*vivipara* is highly characteristic) differs conspicuously from the previous condition

Wight's drawing of his A vivipara was doubtfully named Cantala by Wallich

Wallich's query was due probably to the original "Cantala" having been lost from the garden, and it must, we think, be answered in the negative

In the first place, there is a plant which is fairly abundant and self propagated in some parts of India answering to the figure and description in the *Herb Amb* which *Roxburgh* after mature consideration cited for his *Agave Cantula*

Type of A Cantala lost but reasons for identifying species

In the second place, the Calcutta garden name for *Wight's* species is "*A Cantula* var *vivipara*," which suggests that the Roxburghian plant was readily distinguishable

The plant which we identify with A Cantala is proved by specimens to be plentiful about Bombay, and through the kindness of *Mr. I H. Burkill, FLS*, we have seen undoubted examples of this well marked species from the Northern Circars, the scene of *Roxburgh's* own chief explorations

Roughly speaking, A Cantala extends from Central India (both E and W Coasts) to the N W Gangetic Plain and

the Sub-Siwalik tract as far as the Ravi. In the arid strip between Gwalior and Delhi it seems to be absent, but another Agave has found its way into this vacant corner. AGAVE OF DELHI Apparently A. mexicana, Gamble

From a suite of specimens which the Reporter on Economic Products to the Government of India has placed at our disposal, we think that this other Agave is identical with *Mr. Gamble's A. mexicana.*

Dalzell and Gibson, (*Bombay Flora, Bombay, 1861*) mention three Agaveæ (under Bromeliaceæ) as follows:— BOMBAY AGAVES Dalzell and Gibson's statement

1. *Agave Cantula.* Aloe americana, Roxb. Fl. Ind. 2. 167. *A stately Aloe-looking plant, the central scape rising to the height of 15 or 20 feet, flowers in the rains. The broad ensiform leaves give material for rope or twine.*

2. *A. vivipara, is the narrower leaved plant, leaves flexuous and drooping, which may be seen growing in waste places, and is planted in situations where its roots may retain the earth when washed down by the rains. In the Madras Presidency it is employed in this way to keep up the earth near to the parapets of bridges, a practice which might with advantage be followed on our side of India.*

3. *Furcræa fœtida, Vent. in Usteri Ann. 19—54.—A plant similar in habit to Agave Cantula, but having thinner and more flaccid leaves, and green flowers. In gardens, Bombay, rare."* Graham had said that Bombay vivipara is var. of Cantula

* * * * *

There can be little doubt that the "vivipara" of the Bombay Flora is the form with weak leaves that is common in hedges at Saharanpur.

Graham made it a variety of *A. Cantula Roxb.* *Dalzell and Gibson* repeat *Graham* for part of their remarks, but the "broad ensiform leaves" which they assign to *A. Cantula* are puzzling. Moreover, they seem to ignore *Wight* altogether. Possibly their *Cantula* is *Wight's vivipara.* Dalzell and Gibson's Cantula hardly seems right Cantula, but right Cantala is on Bombay side

It is curious that *Mr. Watson* speaks of *A. Rumphii*, Hasskarl, as '*a very fine Agave, the leaves about 5 feet long and very numerous*" and as like a gigantic *A. rigida*." We hardly think that *Wight's vivipara* would be described "as a stately Aloe" or as "a very fine Agave", unfortunately we have no specimens or picture of the *A. Rumphii* or *A. Cantula* from La Mortola, but without attempting to decide whether *Dalzell and Gibson's A. Cantula* was the same as *Graham's* we are convinced that what we regard as the true Cantula, i.e. the A. Cantala of the *Hort. Bengal*, is a common hedge-plant in the Bombay neighbourhood.

BOMBAY AGAVES

In the Kew Bulletin No 39, March 1890 CXXXI (Bombay Aloe Fibre) the source of this was taken to be *A vivipara* as described by *Baker* in the Gardener's Chronicle (l c) which he had further identified with *Roxburgh's A. Cantula*

The Bombay Aloe Fibre shipped in 1890 was of mixed origin

It is impossible that this "Bombay Aloe" could be *Wight's* plant, because it had leaves 4—5 feet long and rather concave, whereas the leaves of *Wight's vivipara* are conspicuously flat on the upper surface, and the largest leaves observed have not exceeded three feet in length,—the average being two feet and a quarter

Now it is largely from A Cantala

It is clear from the correspondence printed with the Bulletin just quoted that the "Bombay Aloe Fibre" then being shipped to England was not grown at Bombay, but obtained (from more than one species most likely) in the Carnatic and Central India Fibre is now shipped from Bombay that is raised in the immediate neighbourhood, and, so far as our information goes, this is largely taken from **A. Cantala** of *Roxb* (= *A vivipara L according to Baker as above*, not in Gard Chron.)

Roxburgh probably experimented with fibre of A Cantala

Reference to the "*Observations*" quoted above will show that *Roxburgh's* experiments gave a high place among the fibres tested to the Agave there mentioned, which we believe to have been the same that he published later as **A Cantala**

Further enquiry is very necessary to ascertain whether the weak "flexuous" variety of *Graham* is or is not distinct from **A Cantala** Its fibre,—rightly or wrongly,—seems to be generally looked on as worthless

It may here be noted that in *Drury's Useful Plants of India* (*Madras 1858*) Wight's Icon 2024 is quoted for *Agave americana*' although '*A vivipara L*" is given on the next page without comment Of *A americana* it is stated:—

"It is much valued as a hedge plant but its chief importance arises from the "excellent fibres which it yields Not only are these produced from the leaves " but a ligneous fibre is contained in the root familiarly known as the *Pita* thread ' This is much used in the Madras Presidency

We have not been able to confirm the extraction* of fibre from the root of any **Agave**, and as the passage goes on to describe the process of making thread from the leaves there is probably a clerical error somewhere

This "ligneous fibre' reappears in Babu T N Mukerji's *Descriptive Catalogue of Indian Produce contributed to the Amsterdam Exhibition* 1883 but it is there stated to be got from the "stem' (? scape) of '*Agave americana*'

* *Hernandez* speaks of ropes being made with the roots themselves, which is a different matter

We have so far tried to extricate the two species that are most widely spread in India, with the result that for the plant of *Roxburgh* the name given in the Hortus Bengalensis remains unaffected (species E of List = A. Cantala *Roxb.*) SUMMARY OF REASONS FOR NAMES AGAVE WIGHTII

For *Wight's* "*vivipara*" we conclude that a new name must be proposed, and have shown this in our List as Species J = "A. Wightii" accordingly A new name necessary to distinguish Wight's vivipara from the true vivipara

Reasons have at the same time been adduced for holding that the Sisal Hemp (of India) has nothing to do with the plant usually styled *Agave rigida* in gardens

We may now take up the species known in the Calcutta Garden as "*A lurida*" This is not the "*A lurida*" of *Jacquin*, nor is it the plant portrayed at No 1522 of *Sims' Bot Magazine* and described as *A lurida* of the *Hort Kewensis* by *Gawler.* The leaves of that, as well as those of the *A. lurida* of *Baker* (*in Saunders' Refugium T 307*) are on far too small a scale for the Calcutta "*lurida,*" while the habit of the latter is quite different, on the other hand, except that the segments of the perianth open campanulately in the figure, the flower in the *Refugium* is similar CALCUTTA A LURIDA MUST BE CALLED A VERA CRUZ

The earlier figure must be given up, we think, and the description, which was made solely from the figure, goes with it

Aiton's description might apply to several Euagaves, but he doubtless meant to indicate the Agave Vera-Cruz of *Miller*, and the only ground on which *Miller's* name could be set aside would be that it is not classical, but at all events it does not pretend to correct latinity as does "*Vera Cucis*," which is manifestly wrong, or "*Verae Crucis*," which is questionable No caveat can apparently be lodged on the score of priority We therefore venture to restore for this Agave *Miller's* name of Agave Vera-Cruz, without attempting to pronounce whether A atrovirens of *Karwinski*, and certain other forms that seem very much akin to it are specifically distinct or otherwise This is D of our Descriptive List = A Vera-Cruz *Miller*

Closely allied, it would seem, to the preceding is a plant which we have not seen except from the Saharanpur Botanic Garden, where it was received from the continent of Europe

SUMMARY OF REASONS FOR NAMES

under the name of *A Jacquiniana* (reduced in the Index Kewensis to *A lurida* of *Aiton*)*

We shall have to refer to this shortly, but the present point is that the Saharanpur plant under discussion most assuredly is not *A Jacquiniana, Hooker* It is nearest so far as we can judge to the A atrovirens of *Karwinski* (see *Rose* in *Contrib U S National Herb v 223 -225*) ? = *A Salmiana Otto*, which is one of the chief *Pulque* plants of Mexico *Humboldt* (quoted by *Sir W. Hooker* in his note on *A americana* just mentioned) writes "This sturdy, harsh and fleshy-leaved plant is uninjured by the "occasional drought frosts and excessive cold which prevail on "the lofty cordilleras of Mexico and it is possible that the home of the *pseudo-Jacquiniana* is in that climate, and that it is therefore able to survive the winters of N W India, to which A Vera Cruz appears not to be equal in the same degree at all events

AGAVE SPECIES C above is not to be named but is nearest A Jacquiniana

We cannot follow the reduction of *A Jacquiniana, Hooker* to *A lurida*, if by *A lurida* A Vera Cruz *Miller* be intended, and it is hopeless to compare *A lurida* of *Aiton*, as the type† has long ago been lost, while the descriptions in the systematic books are mostly fitted to A Vera Cruz, with the misleading addition of a long caudex (as a compromise perhaps with *A Jacquiniana Hooker*)

We have referred to this Saharanpur "*Jacquiniana*," because if aloe fibre cultivation should extend it seems not at all an unlikely sort to be tried in the colder parts of India, though it might turn out to be of more interest to the Excise than to the Agricultural Department At present there is not material enough even for experiment (in Descriptive List C)

AGAVE SPECIES A

Agave A of the Descriptive List is in cultivation at Saharanpur, though not as a ' fibre aloe " In this the marginal spines are small, fine, ruby coloured and close set on a hardly perceptible border of the same tint running all along the leaf

* *A Jacquiniana* was originally proposed by *Schultes* (*Syst VII P I p 727*) for the plant of the *Collectanea* (with regard to *Gawler's* strict res in *Bot Mag 15 2*) in case *Jacquin's* species should turn out to be distinct from all previously described species. In 1859 an Agave that had come from Honduras flowered at Kew—was identified with *Jacquin's lurida*—and published in the *Bot Mag* (5097) as *A Jacquiniana*; the correct citation therefore is *A Jacquiniana Hooker* This was not impossibly = A vivipara of Wight—A Wightii nobis

† *Mr Baker* may be right in identifying the plant he described in the *Refugium* with *Aiton's lurida* but the segments of the perianth in *Saunders* figure, and the leaves will not do for] A Vera Cruz of *Miller*

margin A plant reported to be naturalized in Burma seems to be this, or at least very near to it Nothing is known of the qualities of either form (if they are distinct), nor can they be properly identified, but they are allied possibly to Agave Keratto of *Miller*

SUMMARY OF REASONS FOR NAMES

Agave Spec es A not to be named but nearest A Keratto.

The Saharanpur specimens are named "*Agave Ixtli*," which is certainly inapplicable The original A Ixtli of *Karwinski* came from Yucatan, and his description (which is quoted in Kunth's Enum., V p 835) leads us to think that his plant must be near the very marked species which has been described by *Mr Baker* in the *Kew Bulletin* (*Nos 67, 68 July August 1892, CCLVII*, False Sisal of Florida) There has been great confusion as to *A Ixtli*, as will be perceived on reference to *Bot Mag 6893*, where an *Agave ixtly* of *Haworth* is mentioned as distinct from that of *Koch*,* besides *Jacobi s*, which was possibly intended to be the A Ixtli of *Karwinski*

The name A Ixtli is not applicable

In the notice just quoted it is suggested that *A ixtly Jacobi* may belong to the same species with that writer's *A fourcroydes* and *A ixtl oides*, of which *5893 Bot Mag* is a representation

In the *Index Kewe sis* the "*ixtly*" (i) of *Koch* (ii) of *Haworth*, and (iii) of *Jacobi* are not separately mentioned, while A ixtli of *Karwinski* is reduced, with "*fourcroydes*," '*ixtlioi les*,' and A sisalana, *Perrine* to the] *A rigid i* of *Miller*.

These identifications rest on the conclusions of *Engelmann* (*Notes on Agave repri ited in Bot Works Cambi i lge Mass p 312, 1887*) His account is too long for quotation as a whole, but an extract will be given under the next species He identifies an Agave that flowered at Antibes in 1872 with A Ixtli (presumably of *Karwinski*), and this again with a wild Agave of Yucatan called by the Indians *Chelem* Of the '*Chelem*' he says '*wh ch I refer with little doubt to Miller s old A rigida*'

He gives no grounds for this last identification, while his description has not much in common with *Karwinski s* of A Ixtli and differs in material respects from that of *Miller's A rigida* other difficulties apart, an insuperable bar presents

* From the not ce of *Koch s* Monograph in *Bull Soc Bot de France vii Rev B bl 189 Karw nsk s A Ixtli only* would appear to have been includ ed and is doubtless that ntended

SUMMARY OF REASONS FOR NAMES

Remarks on the name A Ixtli

itself in the fact that A sisalana *Perrine* sends up suckers freely and continuously, whereas *Miller* says of his *A. rigida*,—"*This sort never puts out suckers from the root, nor have I seen any plants of this kind in flower, although there are many of them in the English Gardens some of which are of considerable age.*"

As to A Ixtli *Karwinski*, and A decipiens *Baker*, the peculiar apple green of the rather narrow channelled leaves is a striking mark, as remarked by both authors, whereas *Miller's* plant was glaucous Moreover *A rigida* came from the *Vera Cruz* country while A Ixtli is, like sisalana, from the *Yucatan* peninsula, which has a Flora, as *Grisebach* has pointed out, more akin to that of the Caribean region than to that of Central Mexico *Miller's A rigida* resembles sisalana in one point it is true,—that it was spineless (though this is by no means always so with sisalana) but this very character divides it from A Ixtli which is well armed

Specimens of what we believe to be *Baker's* A decipiens are growing at Sibpur and Saharanpur,—also with the Agri-Hort Society at Lahore from which garden the Calcutta specimen is derived, the Lahore name being "*A rigida*," and the stock received from Kew originally The Saharanpur supply came from a Nursery in Florida labelled "*A rigida, type*" referring doubtless to the work of *Engelmann* These plants exactly match *Miss Mulford's* illustration (from a photograph) of *A decipiens* (*Missouri Bot Garden Report, Vol 7, 1896, p 67*), and *Miss G. E. Johnson's* outline drawings (pl 68-69), also the sketch in *U S A. Department of Agriculture Report No 9 Washington 1897, p. 45, figure 9*, except that the trunk in *Mr. Dodge's* sketch is more conspicuous,—the subject having manifestly been an old and large specimen from which the outer leaves have been cut or dropped away extensively

"*A. Ixtli*" of *Gartenflora* 1883 (p 149) may be=*A. ixtlioides* of Bot Mag 5893 We cannot think that it is=A decipiens *Baker*, and it is widely removed from A. sisalana, *Perrine* The synonymy is very intricate

We have discussed this Agave (*A decipiens Baker*) at some length,—partly because of its supposed resemblance to A. sisalana,—a resemblance which we are bound at the same time to say we are unable to discover,—and partly in the hope of

clearing up some of the mist that has fallen upon A Ixtli and on *A. rigida* of *Miller*. SUMMARY OF REASONS FOR NAMES.

There is little to guide us as to the identity of *Miller's* plant, but there is nothing to shew that it was a Enagave,—and it should be looked for perhaps in another section of the Genus The description (quoted we presume) in Kunth's Enum, V 830 of *A* (*Littaea*) *revoluta*, Klotzsch seems not far off it *Hernandez* "*Mell V angustifolia*"=*Nequametl* (which is *not* the *Nequametl* of *Markgraf* apparently) should probably find a place in the same neighbourhood

Remarks on A Ixtli

The last species that demands attention is the Sisal Agave, of which, as we have already seen, there is one species and one only in India

Remarks on Sisal Agave

Dr Engelmann,—after giving a formal description of the plant which he assumed to be the wild type of the "Sisal" that is naturalized in Florida,—proceeded to take up certain cultivated forms as follows —

* * * * *

Engelmann has these two varieties of A rigida Mill.

"Var. longifolia *foliis multo longioribus glaucis, aculeato-dentatis, spina terminali non decurrenti*

"Var.? Sisalana *foliis multo longioribus viridioribus margine integris seu pauci-dentatis, spina terminali non decurrenti* Agave Sisalana, *Perrine*, vide infra

"The original* plant was, according to Miller, brought from Vera-Cruz, my specimens, on which the above diagnosis is based, were collected in Yucatan by Dr Schott Dr Perrine forty, and Dr Schott ten, years ago studied in Yucatan this interesting plant,—its different forms and economical uses, and left us accounts of it, the former in Senate Doc 300, Washington, Mar 12 1838, the latter in the Report of the Agricultural Department at Washington for 1869 Both agree that there is a common native species in Yucatan, called Chelem by the aboriginal inhabitants, but from time immemorial a number of varieties, all characterized by much longer leaves, and one also by the absence of marginal spines, and differing among themselves in the quantity and quality of their

* i e *A rigida* Miller on Engelmann's theory

SUMMARY OF REASONS FOR NAMES
Engelmann's views on sisal

fibre, have been cultivated by the natives of Yucatan, and are a staple product of that country to this day, furnishing the well known Sisal hemp The people know them as Jenequen (Schott) or Henequen (Perrine) and distinguish, as [317 (29)] Dr Schott reports, the Yaxci (Yashki) as furnishing the best quality and the Sacci (Sacqui) with the largest quantity of fibre, Chucumci, larger than the last, produces coarser fibre, Babci has fine fibre but in smaller quantity, Citamci, with small narrow leaves and poor fibre, stands probably nearest to the wild plant Dr Perrine mentions another variety, Istle, evidently the Ixtli of Karwinski, as furnishing a fine fibre called Pita These plants yield a return of leaves when four or five years old, and may last 50 or 60 years under proper management, the flowering scape is cut off as soon as four feet high, when, evidently, axillary branches continue the growth of the plant, which is thus kept so long alive by being prevented from flowering

* * * * *

"With the name of longifolia I designate the variety known as Sacci and extensively cultivated in [318 (30)] Yucatan It is principally distinguished by its much longer spiny leaves 4—5½ feet long 3½—4 inches wide, flowers very similar to those of the wild plant but the filaments greenish A. fourcroides, Jacobi Ag 107, probably belongs here, and A elongata, Jacobi, 108 I would refer to this form if the description did not expressly mention a channelled terminal spine

"Agave Sisalana is the name that Dr Perrine gave to the plant known to the natives of Yucatan as Yaxci, the most valuable of the fibre producing Agaves, and which was introduced by him into South Florida some thirty-five or forty years ago, during his efforts to acclimatize commercially valuable tropical plants in that almost tropical portion of our territory, efforts which were aided by Congress by a large

grant of land, but which were destroyed, together with his own life, during the subsequent Indian wars With this Agave, however, he has been successful, as it is now fully naturalized, and is quite abundant at Key West and the adjacent coast." SUMMARY OF REASONS FOR NAMES

* * * * *

The assumption underlying certain of the conclusions just quoted, that the Agaveæ are prone to vary within rather wide limits has influenced systematists undoubtedly, but no evidence has ever been recorded to confirm it, and so far as species naturalized or cultivated in India are concerned, we should be led to just the opposite conclusion Remarks on Sisal

All that we can draw from the facts given by *Engelmann* and others is that there are certain Agaves in *Yucatan* to which local native names have been attached viz, (i) *Yaxci*, (ii) *Sacci*, (iii) *Babci*, (iv) *Citamci*, (v) *Chelem*

Henequen, as *Engelmann* points out, is a general term, and so probably are "*Pita*" and "*Istle*", "*Chucumci*" seems to be the same word as the "*chichimecae*" of *Hernandez* (l c p 271) which he states expressed the Indian mode of cooking portions of the leaves for food (*cf Martius l c p 192*) Probably this also is a comprehensive term rather than the name of a particular plant

Martius, who appears to have consulted several works that are not mentioned by *Engelmann*, states that in the language of the Maya tribes of Yucatan "*Qui*" or "*Quil*" signifies the plant from which fibre is got as well as the fibre, and enumerates as different sorts (i) *Sac qui* (*Sosquil*), (ii) *Yas qui*, (iii) *Chulul qui*, (iv) *Chelem*

Of these the Yas qui or Yash-qui is from the description manifestly *Engelmann's* No (i), and is A sisalana.

It would seem that the Sacqui ranks highest in the estimation of the natives, and this evidently is the plant that is cultivated on a large scale in the district of which Merida (Sisal* is a port of Merida) is the centre, and figured at p 24 of *Kew Bulletin No 62 Feby 1892* (*CCXXVII*, Sisal Hemp) In the same Bulletin, (p 31) it is clearly shewn that the Yucatan field Agave is quite distinct from that which *Dr. Perrine*, who The best form cultivated in the district of Merida

* The bu st fibre port now is said to be Progreso.

SUMMARY OF REASONS FOR NAMES

was many years at Campechy, selected as the best for the Florida plantation, and that he selected wisely.

Sacqui is an Agave of Sisal type.

Martius supposed the Sacqui might be a Furcræa, but the sketch already mentioned and the descriptions suggest an Agave of the Sisalana type, with a stout trunk, however, and generally more the habit of a Yucca. The flowers have been seen at Kew, and the plant pronounced to be probably '*var. elongata*' of (Engelmann's) *A rigida* We do not know on what material *Engelmann's* description of the type of "*rigida*" was founded, but he evidently meant to indicate the "wild" original of the field Sacqui Pending further exploration it can hardly be regarded as established that the wild originals of either Sacqui *or* Yash-qui *have been found or exist anywhere.*

Both have evidently been in cultivation *by the Mayas* from a great antiquity, and we propose until more is known of the Agaveæ of Yucatan to refer to them as,—

Adopted name for Sisal

Sacqui=A longifolia, *Engelmann*

Yash-qui=* A sisalana, *Perrine*

From *Martius'* history it seems possible that a third species has been cultivated in *Yucatan* and that this was **A. Ixtli** of *Karwinski*. *Mr. Dodge's* account of the False Sisal found on and near the coast of Florida makes it not unlikely that this was unintentionally introduced along with "Sisalana" and has meantime been described again (from Florida) as A decipiens of *Baker*.

Remarks on A decipiens

It is condemned by the North American experts, but the qualities assigned *to it* would not necessarily prevent its being used in its native country; more particularly if it be the fact, that a good deal of *local* fibre has for many years been shipped from the Gulf of Mexico to be mixed with other staples. Although existing *solely* in Botanic Gardens in India we include A. decipiens *Baker*, in our descriptive list of Indian Agaveæ, as it should be known, if only to be avoided for the reasons given by the authorities at Kew and Washington

The result of the above examination of the authorities and material available in India may be summed up as follows so far as identity of species is concerned.

* Strictly, this should be A. sisalana, *Perrine* (Engelmann), but the above is less cumbrous.

* The following Euagaves are more or less completely naturalized in different parts of India, viz, REVIEW OF PRECEDING SUMMARY

- A. unidentified, perhaps allied to A. Keratto *Miller*—seen from Burma only,—fibre not known;
- D. A. Vera Cruz *Miller* = *A lurida H B. C.* (not of *Jacquin*, doubtfully of *Aiton*),—fibre not fully known,
- E. A. Cantala *Roxb*—fibre exported from Bombay with that of other species, often, but wrongly called '*Agave vivipara*',
- F. unidentified, approaches A. sisalana, *Perrine* and may possibly be *Engelmann's* "*A rigida, Miller*" or a closely allied form, there is some ground for supposing that this plant is grown as '*A elongata*' in the West Indies,—received in H B C under the name of "*A mexicana*" which, as shewn above, is unmaintainable,—fibre wants to be reported on,
- H. unidentified,—planted in Bengal and in the Ganges "Doabs", naturalized at Saharanpur, and there (wrongly) named "*A lurida*", probably allied to A sisalana,—fibre wants to be reported on,
- J A. Wightii (nobis) = A *vivipara*, Wight (not of *Linnaeus* or of *Lamarck*),—fibre reported on as good, but shorter than A. sisalana

Of the remaining species of Agave in the Descriptive List (Part I) B (A americana, Linn) and C are not naturalized or grown except as ornamental garden plants in India, while G = A. sisalana is a comparatively recent introduction It is believed, however, to be spreading in some places spontaneously

Only one Furcræa has so far shown any tendency to become naturalized in India, which is usually identified with F. gigantea, *Vent.* We think this may be rather F. Commelynii, Salm-Dyck, but information as to it is very scanty

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* Wh[illegible]
and Tı[illegible]
ment E[illegible]
mens c[illegible]
spine ;[illegible]
appare[illegible]

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It is hoped that the references in the text will be found sufficient as regards the authorities mainly consulted; but the subjoined list of the more interesting or important publications bearing on the subject may be found useful, though it is far from exhaustive, and cannot profess, even from the writers' standpoint, to be complete This does not include standard works of reference on Vegetable Physiology and Systematic Botany (from *Linnaeus* onwards) unless for some special reason, and the same applies to local floras also

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† These authors are sometimes said to have proposed to alter the name *A. americana* to *A Maximiliana*' but their actual contention seems to have been that the term *Maguey* covers several species one of which they held to be undescribed, and for this they proposed the name *A. Maximiliana.*

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PART III — GLOSSARY.

GLOSSARY This takes in a somewhat wider field than the preceding parts, because current and vernacular names of plants and their products are not regulated or defined on any system We have aimed at including all names of this class (so far as known to us) that appear to relate directly to the species treated in Parts I and II, but besides these there are sundry names or terms which are apt to be confused with those more properly applied to Agaveæ, or to products derived from them

In India there is much confusion with regard to *Aloes* for example, while in America, different products from the

INTRODUCTION TO GLOSSARY.

Agaveæ and Bromeliaceæ—to say nought of Palms and Grasses—have been almost hopelessly mixed up together

In such cases other names have been included, with due explanations

Marks used in dictionaries to denote modes of orthography which do not prevail in English are not followed in the Glossary, because, for one thing, a majority of the names dealt with were spelled,—with diversified success,—by those who used or published them, phonetically

Different renderings of Indian local names have been in most cases entered separately, on grounds of convenience, and, for somewhat similar reasons, certain names attributed to the classical languages of India and West Asia though perhaps no longer current, have been given a place in the Glossary

"*French*," "*English*," or '*Spanish*" names that are chiefly current abroad are referred in doubtful cases to the language understood to be actually predominant in the country concerned

As regards "Botanical references" the authority for scientific names printed in Italics should be sought in the second column, for others the writers of these notes are primarily responsible

The original authority for vernacular names has been cited so far as was possible but where specimens have been inspected we have quoted the source from which the specimen was directly communicated as our authority for the local designation —thus for certain Indian names we quote the Reporter on Economic Products to the Government of India or the Government Botanist Madras, because though the name may have been previously recorded, it is from specimens collected by Sir George Watt by Mr Barber, or by Mr Burkill that we have been able to identify the plant said to bear a particular name in a particular locality with some approach to certainty

For the sets of specimens received from Madras we are greatly indebted to the co operation of the Government Botanist and the Revenue authorities

It is hoped that the Glossary may help to clear the way both for those who may be called on to pronounce on the identity and character of Indian Aloe fibres and for all who are interested in them agriculturally or commercially Those who have made a study of any like subject will be able to

INTRODUCTION TO GLOSSARY

appreciate the intricacy of confusion that besets the local and vernacular terminology, as well as the loss and inconvenience due to it

The chief difficulty is to keep the list within manageable bounds In his catalogue of Fibre Plants of the World, from which we have derived much help, Mr Dodge has observed (under '*Grass fibres*')—

"while fibrous substance is extracted from many species of *Gramineae* the family of true grasses, the term is frequently applied to fibres derived from plants that are grasses in no sense of the word, and it is therefore misleading Examples '*China grass*' the fibre from a tall shrub (Boehmeria) '*Sisal grass*' the fibre from a fleshy leaved Agave and '*Silk grass*' which may mean *Bromelia* fibre, or almost anything '

We must plead guilty to having omitted 'Sisal grass" and would gladly have passed over a good many more that figure in our list, as it is but it seemed better for the present to err rather on the side of inclusion

We have not attempted to expound any purely botanical terms Those employed in the text of Part I should not be found very difficult, and in any case, where a reader not versed in the botany of the *Agaveae* may want a decision, his best course would be to send an inner and an outer leaf, with some flowers in spirit (if the plant is poling), also a few pods if available to a competent botanist for identification

The column in the Glossary of references to Parts I and II of the Bulletin is meant to assist in finding matter bearing on the botanical history of the plant or plants to which the commercial or vernacular name is believed to refer For economic or industrial details the Dictionary of Economic Products for India, or in case of other countries works such as Spon's Encyclopædia, should be consulted Where only the author's name appears in the second column fuller references will be found under Bibliography (Part II, p 72 and foll) or on the pages quoted in the sixth column

Glossary of local and commercial terms referring to the Agaveae (also certain other fibre plants) or to their products.

NAME	Authority	Language	Where used	Scientific determination
ABACA	Spon also Kew Bull XXXI	Filipino	Philippine Islands	Musa textilis, Nee
ABECEDAIRE	Daniells	French	France	*Agave americana*
ABACAXI	Martius	Tupi Indian	Brazil	*Ananassa sativa* Linn
ACEBAR	Rumpf	Spanish	Spanish Colonies	Aloe vera, Linn
ACERBE	De Lecluse	Portuguese	Portugal	Ditto
ACIBAR	Ditto	Spanish	Spain	Ditto
ADAM'S NEEDLE (1).	Spon, also Watt E D	English	Cosmopolitan	Yucca gloriosa, Linn
ADAM'S NEEDLE (2)	..	Ditto	Ditto	Agave sp
ADAM'S NEEDLE (3)	Guilfoyle	Ditto	Australia	*Yucca filamentosa*
AFRICAN HEMP	...	*Ditto*		Sansevieria sp
AGAVE PALO	H B K *	Spanish	Central and South America (Mexico and Venezuela)	*Tillandsia recurvata* Willd ?

* Humboldt, Bonpland and Kunth

Page	Remarks
	The *Manilla* hemp, to be distinguished from *Manilla Aloe fibre*
85	Probably (D) = *A Vera Cruz*, Mill Applied to other plants besides
	The cultivated Pine apple, which has yielded fibre in America, Malaya, India, &c.
79	Introduced with the plant by the Spaniards and the Hollanders to their East Indian possessions See *Acibar*
79	De Lecluse says that this is a corruption of the next following. Cf. *Azul Champahra.*
79	[illegible]
78	[illegible] confirmation
87, 105	Said to be applied in Kangra (Panjab) to an *Agavea* (A. Cantala, Roxb ?)
78	Introduced into Australia and reported suitable for fibre extraction
77	Abbreviated from '*African Bowstring hemp*,' produced by different African species of *Sansevieria*
97, 98	Different species of [illegible] known as 'Spanish [illegible] for stuffing mattr[illegible] (Vegetable Hair) [illegible] came to bear a na[illegible] 'American aloes'

Name	Authority	Language	Where used	Scientific determination
AGAVE THREAD		English	Europe and America	Agave and Furcraea sp
AGUA DE MIEL	Miss Gdn Rept 1896	Spanish	Central America (Mexico)	Agave atrovirens, Karwinski (and other species ?)
AGUA MIEL	Martius	Do	Ditto	*Agave Americana*
AGUARDIENTE	..	Do	Spain and Spanish Colonies	.
Ditto	Rose	Do	Central America (Mexico)	Saccharum officinarum Linn
AGUARDIENTE DE MAGUAY	Miss Gdn Rept. 1896	Do	Ditto	*Agave americana*
ALLAGUEY	Fragoso (in C Bauhin also Sloane)	(Not known)	C America (? Grenada)	*Agaceae* sp
ALOE (1)	.	English, French, German	Cosmopolitan	Aloe sp
ALOE (2)	C Masson (Journeys I, 104)	English	India	Nannorhops Ritchieana, H Wendl

Page.	Remarks
...	Applied to fibre or prepared yarn obtained from different species of *Agaveae*.
97, 98, 100, 139, 140	The sap that exudes into the basin (*cajete*) formed by cutting out the vegetative cone or 'bud' of certain *Agaves* when about to 'pole', to obtain the '*Pulque*' or native cider of Mexico. Literally 'mead', 'honey water', or 'hydromel.' Some authorities state that a spirit (*Aguardiente*, see below) is got from this liquor by a further process, also vinegar.
Do.	The true *Agave americana* of Linnæus, our (B), does not seem to be one of the '*Pulque*' kinds, but in any case what Martius had in view was a different species
98	'Fire-water,' or Brandy.
Do.	Rose states that the spirit sold at the present day in Mexico as '*Aguardiente*' is distilled from 'Cane,' presumably from molasses (but see the next, also '*Chinguirito*')
88, 98	See '*Agua de Miel*,' '*Chinguirito*,' and the preceding
97	(By a misprint in Daniell *Allagueo*) Fragoso identifies his *Allaguey* with the *Fil y Agulla* of S Spain which is our (D) = *A. Vera Cruz*, Mill. Probably corrupted from the Spanish '*El Maguey*,' Cf '*Amaguey*.'
113	The ... [illegible] South Africa and the adjacent islands, but at least one species is found in S. Europe and an allied form on the coasts of India; while another form (*Aloe indica* of Royle) occurs at the base of the N.-W. Himalaya. The leaves of certain species of *Agave* resemble those of the true *Aloe*, so that when the *Agaveae* of the new World came under notice they were classed with the *Aloes*, and this reference, though recognised scientifically as an error since the time of Linnaeus, has persisted in the popular vocabulary of different countries to the present Economically the true *Aloes* are chiefly important as the source of a drug, while the *Agaveae* ('American Aloe,' etc.) are best known as yielding fibre.
...	[illegible] is no doubt the same.

NAME	Authority	Language	Where used	Scientific determination
ALOE AMERICANA	Danieli	Italian	Italy	*Agave americana*
ALOE BORMICA	Ditto	Ditto	Do	Ditto
ALOE FIBRE (1)	Dodge	English	India	*Aloe indica*
ALOE FIBRE (2)	Balfour (Cyclopædia)	Ditto	S India	*Agave americana, A vivipara Furcraea gigantea Yucca gloriosa*
ALOE FIBRE (3)	Imp Inst Hand book (Ind Sect) No 12	Ditto	Do	*Agave americana*
ALOE FIORENTINA	Bertoloni	Italian	Italy	Ditto
ALOES (1)		English, French, German	Cosmopolitan	Aloe, species
ALOES (2)	Bojer Hort Maur. p 353	French	Mauritius	*Agave americana* Linn (Sprengel)
ALOES A PETITES FEUILLES	Ditto	Do	Ditto	*Agave angustifolia, Haw*
ALOES D' AMERIQUE	Danielli	Do	France	*Agave americana*

Page	Remarks
	[illegible] Mortola) [illegible] ra, one [illegible] t from [illegible] to some [illegible] which is most commonly spontaneous on the Mediterranean coasts is our (D) *A. Vera Cruz*, Mill, and in S Europe this is often called '*A. mexicana*' or '*A. americana*' In Britain it has usually been called since Aiton's time '*A. lurida*,' but is sometimes ticketed '*A americana*.'
Do.	Possibly the true *Agave americana* of Linnaeus, as distinguished from the '*A. americana*' of S Europe, which is commonly = D (*A. Vera Cruz*, Mill)
	Fibre from India was shown at the Chicago Exhibition of 1893 under [illegible] e is found [illegible] ave usually [illegible] this plant [illegible]
96	By *A. americana* is intended probably *A. Cantala*, Roxb (E), and *A. Vera Cruz*, Mill (D), by *A vivipara* (J) of these notes, *i.e.*, *A. Wightii*, or perhaps (E) also. *Yucca* fibre has undoubtedly been handled in Madras, but the species is not, so far, ascertained properly.
96	In 1893 Mr. Thompson reported that 'Aloe fibre' was used in his brush factory in the Nilgiris, Genl M'Leod also reported that the fibre of the 'American aloe' had been used for brushmaking, and apparently brush fibre from *Agaveas* was readily obtainable in certain bazars The plant intended by Genl. M'Leod seems to have been the '*Railway Aloe*' which is usually our (D), *i e*, *A. Vera Cruz*, Mill. (see also *Mexican fibre*)
111, 120	Probably = (D) which is *Agave Vera Cruz*, Mill
107	The drug produced from *Aloe vera*, Linn, *Aloe Perryi*, Baker, and other species of true *Aloe*.
96	Bojer cites Andrews' Repository, but the plant which he saw naturalized was probably distinct from that which he says was grown in gardens
88	Cf. *Anana de pite*
118-120	'*American Aloe*' See *Aloe americana* above.

Name	Authority	Language	Where used	Scientific determination
Aloes Pite	Aublet	French	S America (*French Guiana*)	*Agave americana*
Aloes Pitta	Danielli	Ditto	S France (*Provence and* Roussillon)	Agave Vera Cruz, *Mill* (probably)
Aloès Pitte	Loiseleur Deslong champs (*Flor Gall Ed L P* I p 239)	Ditto	*France*	*Agave americana*
Aloes Vert		Ditto	Mauritius	*Furcraea* sp.
Alos	Visiani	Sclavonic	S. Europe (E Adriatic littoral)	*Agave americana*
Amagunt	Edwards	Filipino	Philippines (Pangasinan and *Zambales*)	Agave sp
American Aloe (1)	Smith (Dict Ec Plants)	English	*Cosmopolitan*	*Agave americana*

Page.	Remarks
98	Probably a *Furcraea*
86 112 126	Cf *Pita*
86, 112, 126	Agave (D) = *A Vera Cruz*, Mill.
94 95 105	'*Mauritius Hemp*' In Madras fibres have been shown which were ascribed to '*Agave viridis*' meaning probably a species of *Furcraea* introduced from the Mauritius (see *Mauritius Hemp* and *Piet*, also *Green Aloe*)
86 120 126	= (D) i e, *A Vera Cruz*, Mill
	M[illegible] Edwards [illegible] from the Spanish '*El Maguey*' (see also *Manilla Aloe flore*)
98 99 118	A comprehensive term for different species of *Agave* which has spread everywhere since the introduction of *Agaves* into S Europe where they were popularly compared with local species of *Aloe* The *Agave americana* of Linn is of comparatively minor economic importance, and the many references made to '*Agave americana*' as a source of fibre, beverage &c., usually relate to some other plant, not always an *Agave* (see also *Amerikanische Aloe*, *Aloe Americana etc*)

[illegible]

Name	Authority	Language	Where used	Scientific determination
American Aloe (2)	Balfour (Cyclopædia)	English	India	*Agave americana*
Amerikanische Aloe		German	Germany	*Agave americana*
American Aloe Fibre		English	India	...
Amole	Dodge (also Mrs Mulford, Coulter Rose &c)	Spanish	C America	Agaveæ, Sp
Anai Kathalai	Government Botanist Madras	Tamil	S India (Tinnevelly)	Agave Vera Cruz, Mill
Anaik Kathaghai	Mukerji Descr Cat. Ind Prod *Amsterdam* etc 1883	Do	Ditto	Ditto
Anaik Kathazhai	Watt E D	Do.	Ditto	Ditto
Anai Kattalai	Government Botanist Madras	Do	S India (S Arcot)	Ditto

Page	Remarks
99	The true *Agave americana* is not common in India, except as an ornamental plant in gardens &c, while the term is popularly applied to more than one species of *Agave* (as well as *Furcraea*)
84, 86	In Northern Europe this title is usually applied to the true *Agave americana* of Linne, while the *Agave americana* (or American aloe) of S Europe is, for the most part, *A Vera Cruz*, Mill. (our D), which does not thrive as a rule out of doors in N Europe
105	Used to indicate the fibres locally obtained by different processes [illegible]
97	Several *Agaveas* possess detergent qualities In the West Indies certain kinds of *Euagave* (*A Morrisii*, Baker and *A Keratto*, Mill possibly also *Furcraea*) are or were generally used for scouring floors &c, and from one or more of these a soap has been manufactured which can be used with salt water The fine toilet soap made in Illinois is from a *Yucca*, but several *Agaves* of the *Manfreda* and *Littaea* groups yield scouring material in the United States and N W Mexico These are known locally as "*amole*" The rootstock of the *amole* plants is said to be the part used it is the leaf of the Euagaves in the West Indies 'Amolilla' (Dodge) is a *Prochnyanthes* and not known in India
83, 85, 86, 99, 103, 126 131, 139, 147	(D) of this bulletin See *Anai Kattaley*, etc
...	Variously spelled 'Anak' or 'Anaik,' and the second part with a 'g' or a 'z' Meaning not known to us Cf *Anai Kattalai* and *Kadanaku*.
Do	See the preceding
Do	(D) of this bulletin. See *Anai Kathalai*, etc

Name	Authority	Language	Where used	Scientific determination
Anai Kattaley	Balfour (Cyclopædia)	Tamil	S. India	*Agave americana*
Anai Kuttalei	Brown and Wood	Do.	S. India (Madras)	*Agave americana* Linn
Anak Kattalai	Government Botanist Madras	Do.	S. India (S. Arcot)	Agave Vera Cruz Mill.
Anak Kattali	Ditto	Do.	Ditto (Coimbatore)	Ditto
Anakyitha	Ditto	Malayalam	S. India (Malabar)	Ditto
Anana de pite	Bouton (in Sloane)	French	Mascarene Islands	*Aloe Yuccae folius.*
Ananas	Watt E. D.	American native language not specified	Cosmopolitan	*Ananas sativa*, Linn.
Ananas Boaya	Rumpf	Malay	Amboyna, &c.	Agave Cantala *Roxb.*
Ananas bravo	Acosta	Portuguese	S. W. India	Pandanus sp.
Ananas Costa	Martius	Ditto	Java	*Agave Rumphii*
Ananas Manso	Do.	Ditto	Portugal, Brazil &c.	*Ananas sativa*, Linn.
Ananas utan	Rumpf	Malay	Amboyna, &c.	*Agave Cantala* Roxb.
Arbol de las Maravillas	Acosta	Spanish	Spain, &c.	*Agave sp.*
Arbol de Maguey	Do.	Ditto	Ditto	*Ditto*

Page	Remarks
83 84, [illegible]	The proper spelling, we believe is 'Ane kattale,' *Kattale* is [illegible] and [illegible] in [illegible] be [illegible]
95	Evidently the same as the *Anai Kattaley* of Balfour
83, 85, 86, 99, 106, 126 131, 139, 147	Variants, no doubt of '*Ane*' (or 'Anai') *Kattale*, which appears to be applied very uniformly in the Madras Presidency to Agave (D)
86, 147	Agave (D) The first element may be='Ane,' and the second=Kia (Pandanus)
117	Perhaps a *Furcraea*, but the 'Anana' suggests rather a Bromeliad See also *Pitte Ahetz*, and *Laffa* The *Bouton* quoted by Sloane was, of an older generation obviously than the Editor of the Reports of the Natural History Soc. of the Mauritius
	O [illegible] various *Nanas* [illegible] whose [illegible] e, fibre plants particularly
88, 133 &c	See *Nanas Boaya*
.	See *Kyre & Mellis Cour.*
88, 133, 110	Martius thinks that this Agave, which has been identified with our (E)=*A Cantala, Roxb* was so named because brought to Java from the Indian Coast
...	=Cultivated pine apple.
88, 133 &c	See *Nanas utan* and the preceding The Portuguese in India likened the screwpine (*Pandanus*) to the American pine apple, which they introduced to India and Malaya and the Malays have transferred the name either from the pine apple or the screwpine to certain *Agaveae* (see *Nanas utan, &c*)
110	See *Maguey.*
110	Ditto

Name	Authority	Language	Where used	Scientific determination
Arba	Linschotten (in Bauhin)	Guzerati ?	Western India (Guzerat)	Aloe sp ?
Arba	Garcia del Huerto Aromatum etc ed Clusius Antwerp 1567	Ditto	W and Central India (Guzerat and Deccan)	*Aloe Agave* or *Pandanus sp*
Azul		Portuguese	Portugal &c	Aloe sp
Azul Cham parba	Ruiz and Pavon	Spanish	Peru &c	*Agave americana*
Bahamas Hemp	Kew Sel Papers (Addl Ser II) LII	English	England and America	*Agave rigida var*
Bakkul	Balfour (Cyclopædia)	Bengali	India (Bengal)	*Agave americana*
Balu bakkisa	Ditto	Telegu	S India	*Agave americana*
Banada kat tala	Liotard	Telegu	S India (Mysore)	*Agave variegata*
Banskeora (1)	O Shaughnessy (Bengal Dispensatory, Calcutta 1819)	Hindustani	N India	*Agave vivipara*
Banskeora (2)	Watt E D	Hindustani	N India	*Agave americana*

Page	Remarks
113 ..	This may have been a Persian name, but seems to be used in the *Malay Archipelago for a species of Pandanus* It is given here as it may still be in use locally Unidentified fibres with a similar name have been exhibited in S India
113	Th [illegible]
8	
141, ..	
96	Balfour meant perhaps the Bengal Presidency No such name seems to be known for *Agave* in Lower Bengal; but it is a local term in parts of Central India for the fibrous bark of the roots of certain trees used' [in Malwa] * * * 'as a cheap substitute for string and cord,' (Dr Tranter in Liotard, p 65) and about 1852 '*Agave Cantala*' which is said to be common in Malwa was used as a substitute for the true '*Bakkul*' The traditional '*Bakal*' is birch bark from the Himalaya while *Bacula* of the 'Asiatic Researches' was an epithet of several trees or herbs with fragrant flowers *e.g* *Mimusops Elengi*, (Bengali 'Bokul')
105	Cf *Bakus* &c
..	Probably *Agave americana*, Linn var *variegata*, from which fibre has been obtained experimentally The compilers say the staple was shorter than that of 'Agave americana' fibre by which they doubtless meant (D)
91, 102 105, 121 123, 127 131, 133 137, 147	from '*Bans*' = bamboo and '*Keora*' = screwpine: commonly applied from Behar to the E Panjab to Agave (J) = *A Wightii* of this Bulletin At Saharanpur (E) and (H) are distinguished as *Rambanskeora*
96	*Banskeora* seems pretty well restricted to (J) = *Agave Wightii*.

Name	Authority	Language	Where used	Scientific determination
BARA KANUR	Watt E D	Bengali	India (Bengal)	*Crinum asiaticum*, Linn var *toxicaria* Herb
BARA KANWAR	Ditto	Hindustani	S W India	*Agave americana*
BARBA DE PALO	Dodge	Spanish	Central America (Venezuela) &c	*Tillandsia usneoides*, Linn
BARBADOES ALOES	Voigt (Hort. Sub Calc) etc	English	Cosmopolitan	Aloe *sp.*
BAS KITBI	Liotard	Hindustani	N W India (Rohilkand)	Agave *sp* ?
BASTARD ALOE	Brown and Wood (also Balfour)	English	S India	Agave Wightii (of this Bulletin)
BASTARD TEQUILA	Rose	..	Central America (Mexico)	*Agave Sp*
BEAR GRASS	Dodge (and others)	English	Northern and Central America, also in Australia	Yucca Sp

Page	REMARKS
...	Cf *Baskitri* and *Sodursun*, also the following
96	'*Kanwar*' (Cf. *Kantala*, *Kenda Catesala* and so forth) probably refers to the prickly leaves of the *Aloe* and *Agave* but the 'Kanwar' of Central and W India is confused with Kanwar (*Crinum*) on the one hand, and with species of *Pandanus* (*Keora Kiakanta*, &c) on the other Cf the preceding, *Baskitri* and *Sodursun* also *Kunwar*
•	Lit Wood or Tree beard Nat Ord *Bromeliaceae* Cf *Agave Palo* above
	A pharmaceutical term for the drug prepared from a true *Aloe*
	Liotard, quoting an epitome of local reports on paper fibres in the North Western Provinces, says that in the Lalitpur District (towards Central India) a wild fibre plant occurred called *Soodursun* which was identified with a Rohilkund plant called *Baskitri*, from which paper was made at *Moradabad* (Rohilkand) As to the 'Soodursun' see *Sodursun* below the *Baskitri* was perhaps Agave (J), Bas (scent) having been substituted for Bans (bamboo)
91, 147	The first *Agaves* to be imported into India were as we believe E = *A Cantala* Roxb, —and J = *A Wightii* ('A vivipara' of Wight) Both probably reached India by the Pacific from the Jalisco Province (now a State) of Mexico, where a somewhat similar distinction is kept up between the '*Tequila*' and '*Bastard Tequila*' 'Bastard Aloe' seems to be in use in S India only, and is probably a translation from some forgotten Portuguese appellation
	Mr Rose identifies the '*Bastard Tequila*' (which is presumably a translation of the local Spanish) of Western Mexico with the [illegible]
78	Species of *Yucca* and *Dasylirion* which yield a fibre in the Southern States of the Union and in N. Mexico are called '*Bear grass*' None of these have been introduced so far in India, unless horticulturally.

Name	Authority	Language	Where used	Scientific determination
Bhoortha Pharangi	Govt Botanist Madras	Canarese	S India (S Canara)	Agave Cantala, Roxb
Bhuttala	Watt E D	Canarese	S India	*Agave americana*
Bilatee Ananas	Roxburgh	Hindustani	India	*Agave Cantala*, Roxb (Fl Ind) [A Cantala Hort. Beng]
Bilatte Nanas	Martius	Hindustani	India	*Agave Cantala*, Roxb.
Bilati Anannas	Voigt	Bengali	India (Calcutta)	*Fourcroya Cantala*, Haw [Agave Cantala, Roxb]
Bilati Pat	Watt E .D	Do.	Ditto	*Agave americana*
Binder Twine		English	N. America, etc	Agave spp
Bitter Aloes	..	Do	England, &c.	Aloe spp
Bois Chandelle	Aublet	French	Mauritius	*Agave fœtida*, Linn.
Bois de Meche	Martius	Do.	Antilles	*Fourcroya cubensis*
Bois Meche	Aublet	Do.	Mauritius	*Agave fœtida*, Linn

Page	Remarks
83, 133, &c.	'Bhurt' in different Indian dialects signifies a 'thorn' or 'burr' and 'faringi' is of course = 'frankish' or 'foreign'
105 &c	Perhaps this is (J), = our *Agave Wightii*
87, 100 105,129, 133, 135 to 139, 147	'Foreign pine apple' = (E) of this Bulletin See also *Adam's Needle* (2), *Aloe fibre* (2), *Ananas boaya* *Ananas costa* *Bombay aloe fibre*, &c Roxburgh says that *Bilatee ananas* is the 'Hindoo' name, (i e in the lingua franca of 'Hindustan') see *Bilati Anannas* (Voigt) also
Do	Martius appears to be quoting a paper, which we have not seen, by Blume
Do.	A Serampore Garden name perhaps, and Roxburgh may have got it from Carey
96	Meaning 'foreign fibre,'—Cf *San ka Nar*
96	Twine made from vegetable fibre used for tying sheaves at harvesting One of the chief uses of the *Agave* fibre commercially is or was recently to supply the demand for Binder twine in the U S A. [illegible]
127	*The pharmaceutical substance obtained from different species of true Aloe.*
94, 95, 97	From the 'chandelier' inflorescence a *Furcraea* See the next.
94 95, 97	Martius, referring to *Labat's* 'Voyage aux Isles' notes that the *Bois de Mêche* (i e, 'Tinder or Match tree') yielded fibre, and that the pith of the stem (flowering scape) was used for tinder and for corking phials etc *Agave* and *Furcraea* were perhaps best known to the early voyagers owing to the dry 'poles' furnishing a handy substitute for tinder to mariners The name crossed from the Islands to Guiana, and travelled thence to the Mauritius See *Bois Meche*, and *Tol, Mauritius Hemp*, *Piet* and *Pite* also
94, 95, 97	*Agave fœtida* of Linnaeus is *Furcræa gigantea* Vent.; but Aublet goes on to quote a synonym from Plukenet which is *F tuberosa* Ait Both were probably known in Guiana (whence the *Pite* came to the Isle de France), but the species now grown in the Mauritius is perhaps still a third; see *Mauritius Hemp* etc

NAME	Authority	Language	Where used	Scientific determination
BOMBAY ALOE	Dodge	English	England &c.	*Agave vivipara*
BOMBAY ALOE FIBRE	Kew Sel Papers (Addl Ser II) LX & LXI	Do	England	*Agave vivipara* Linn
BOMBAY HEMP	D	Do	Do	*Ditto*
BONTHA KITHANARA	Govt Botanist Madras	Telugu	S India (Godaveri)	Agave V Cruz, Mill.
BOWSTRING CREEPER	Dodge	English	India	*Marsdenia tenacissima*, W. and A
BOWSTRING HEMP (1)	Roxburgh	Do	Do	*Sansevieria Zeylanica*, Willd
BOWSTRING HEMP (2)	Madras Exhibition Cat. 1855	Do.	S. India (Masulipatam)	Agave-sp.?
BOWSTRING HEMP (3)	Martius	Do	India	*Sansevieria lanuginosa*, Willd.

Page	Remarks
138	The reference is to '*Bombay Aloe Fibre*' (which see), but the name has been given in India to several distinct species, including our (E). *A. vivipara* of Wight,=our (J) or *Agave Wightii*, is sometimes called 'the Bombay Aloe,' but yields comparatively little perhaps of the '*Bombay Aloe fibre*.'
138	When the export of '*Aloe fibre*' from India recently attracted notice in England, the chief port of export was Bombay, and the staple seems to have been [illegible] Specimens of a plant [illegible] sent for determinatio[illegible] largely grown near Bombay city is mainly from our *Agave* (E), i e, *A. Cantala*, Roxb (naturalized) and *A. sisalana*, Perrine (planted).
	See the preceding. Usually applied, however, to *Crotalaria* and *Hibiscus* fibre
86, 147	(D) of this Bulletin. Cf. *Kithanara*, etc., also *Kalabuntha*.
...	See *Bowstring Hemp* (1) and (2).
77	Roxburgh's experiments on Indian fibres led him to give the [illegible]
77	The vernacular equivalent '*Saganara*' (which see, also *Saganara Matha*) is applied in the South to an *Agave* fibre; on the other hand [illegible]
77	T[illegible]

Name	Authority	Language	Where used	Scientific determination
BRAMARAKASHIE	Madras Exh Cat 1857	Tamil	S India	*Agave sp*
BRAMHA RAKASI	Balfour (Cyclopædia)	Do	Ditto	*Agave americana*
BROMELIA PITA	Squier (also Dodge)	Spanish	Mexico	*Bromelia sylvestris*
BROOMROOT	*Kew Sel Papers* Add Ser II Arts. LXXIX, LXXX (also Dodge)	*English*	Cosmopolitan	Epicampes macroura *Bth.*
BRUSH FIBRE (1)	Madras Exh Cat, 1855	English	S India	*Agave Cantula*
BRUSH FIBRE (2)	..	Do.	England and America	......

Page	Remarks
96	See the next, and *Rakas*
96	Cf *Rakas*, etc 'Brahm' or 'Birm' is prefixed to the names of various prickly plants throughout India.
93	The history of this [illegible] that the true '*Pita* [illegible] by one or other [illegible] Confusion has arisen [illegible] S Europe, also in the Himalayas, see *Brush Fibre* 'Broom *root*,' it may be noted is again quite a different thing from 'Broom *corn*,' a *Sorghum* (Nat Ord Gramineæ) which abounds in parts of India, and has been carried to the U S A, where it is locally grown and used for brush making Brushes are made throughout India, usually by gypsies, from the roots or stems of different grasses, in Madras called 'Broom sticks' See *Aloe Fibre* (3), *Bromelia Pita*, *Brush Fibre*, *Mexican Fibre* (1) *Mexican Whisk*, *Istle* (1), &c
96	[illegible]
96	L[illegible] preceding

* *i.e.*, as '*Mexican*' fibre

Name	Authority	Language	Where used	Scientific determination
Puddu Kattale Naru	Watt E D	Canarese	S India	*Agave americana*
Bulbil	Baker and others	English	..	.
Butt	..	Do	...	Agave spp
Cabuja	Martius, also Dodge	Spanish	Antilles	*Furcraea gigantea*
Cabulla (1)	Dodge	Do	Central America (Costa Rica)	*Furcraea tuberosa*
Cabulla (2)	Squier	Do.	Central America (Yucatan)	*Agave Ixtaiana*
Cabuya	Seemann (Voyage of the Herald, Botany, p. 216)	Do	Central America (Panama)	*Fourcroya tuberosa* Ait.
Cajete	Martius	Do	Central America (Mexico)	*Agave americana*
Cajun	Dodge	Do	Central America	*Furcraea cubensis*

Page	Remarks
96, 105, &c.	Kattale = *Aloe*, &c. Nar = *Fibre*
81	A young plant sprouting from a flower shoot in the place of a seed vessel on the flowering stem or 'scape' of certain *Agaveae* All the species dealt with in this Bulletin are believed to produce bulbils, notably (D), (E), (G), (H) (J) A to (K) we have no certain information
	The (usually thickened) base or stalk of the leaf in *Euagave* and *Furcraea*
94, 95	Variously spelled as *Cabouya*, and *Cabuya*—(origin unknown, but perhaps provincial Spanish) often regarded by Spanish writers as = *Agave americana* Apparently first mentioned by *Oviedo* [illegible] &c, and the next also
105, 129	Dodge notes that samples from Costa Rica resembled Sisal fibre (i e, our G) [illegible] of his *Caraga* [illegible] Ait that its ' [illegible] unknown, so fa [illegible]
88, 89, 99, 105, 109, 117, 128, 135, 139, 142, 147	[illegible] informed, Piso notes that from his *Caraguata guacu* a very fine fibre suitable for 'hammock cloth' was made we suspect that statements which ascribe the finer kinds of '*pita*' to the *Agaveae* are often erroneous, and that the fine sorts of thread are more commonly derived from different little known *Bromeliaceæ*
129	*Furcraea tuberosa* Ait. Found on the volcano of Chiriqui. Seemann says the fibre of the leaves is very strong and used for making ropes and hammocks
105, &c	The basin which is scooped in the centre of the leaves of certain *Agaves* (*A atrovirens*, Karw also *A. cochlearis* Baker, &c., according to Rose) to collect the sap for fermenting 'Pulque.' The liquor is drawn off daily with a long gourd (acojote) and the face of the basin (cara) scraped to promote a fresh flow of the liquor.
94, 95	Wight figures as *F. gigantea* Vent. a *Furcraea* (Ic 2025) which may be *F cubensis*, Vent (See *Mauritius Hemp*, &c)

Name	Authority	Language	Where used	Scientific determination
CANTALA (1)	Asiatic Researches VI, 230	Sanscrit	N. India	*Agave?*
CANTALA (2)	Ainslie	Sanscrit	N. India	*Agave vivipara*
CANTON HEMP	Martius	English	India, &c	*Musa troglodytarum textoria*
CARAGATE	Moerman	French	Belgium.	..
CARAGUATA (1)	Kew Bull Sel Papers Addl Ser II Art. XXXVIII	Spanish	S America (Paraguay)	*Bromelia argentina*, Baker
CARAGUATA (2)	Martius	Do	Antilles	*Fourcroya cubensis*

Page	Remarks
130	[illegible] and *Kuntala*, also *Kantal*, &c
130	W[illegible] *Kathal*
.	From the botanical identification this should be = *Musa textilis*, but *Agaves* also are reported to have been cultivated on the Chinese Coast, as a supplement, most probably to the true Manila fibre
97	'Or Spanish Barb—another species of vegetable hair' *Tillandsias* yielding '*Crin vegetal*' are no doubt intended See *Agave palo,*— and *Barba de palo* A common Spanish American name is 'Barba de Vello' where 'Barba' = 'rootlets'—'fibre' Cf the following
93	'*Caraguata,*' which is variously rendered as *Caroata Cravata,* [illegible] present, to include any economic species The Paraguay *Caraguata* was exhibited at Paris in 1889, and was ascertained at Kew to be derived from a then undescribed *Bromelia* There are at least two kinds of southern *Caraguata*, viz —*Caraguata de agua*, and *Caragata ibera*, one of which remains to be identified. See *Ibera*, also *Istle*, *Mexican fibre*, *Silk grass*, *Curratow* and *Keratto*
94, 95	It is not clear whether Martius regarded *Caraguata* as the Carib name of *F cubensis* (or F *cubensis* and F *tuberosa*) as distinguished from F *gigantea* ('pita'), but the home of the *Furcraeas* was more likely on the mainland, near the Isthmus, though they may have spread to Cuba first and thence back to the mainland from the eastern *Antilles*

Name	Authority	Language	Where used	Scientific determination
CARAGUATA (I)	Piso De Ind Utr Re Nat etc Amst. 1658	Spanish	S America (Brazil, etc)	Bromelia Pinguin, Linn
Ditto (II)	Do	Do	Ditto	Furcraea tuberosa, Ait
Ditto (III)	Do	Do	Ditto	Aloe, Sp
Ditto (IV)	Do	Do	Ditto	Bromeliacea ?
Ditto (V)	Do	Do,	Ditto	Karatas, Sp.
CARAGUATA ACANGA	Do	Do.	Ditto	Bromelia Pinguin, Linn
CARAGUATA GUACU	Do. (Also Marcgraf acc to Martius)	Do	Ditto	Furcraea tuberosa, Ait
CARATA	Martius	Carib	West Indian Islands	*Agaveae* and *Bromeliaceae*
CARATAS	Labat (in Martius)	French	Antilles	*Furcraea cubensis*
CARAUA	Dodge	Brazilian (Lingoa geral)	Brazil	*Bromelia* Sp.
CARDON	Gorrara	Spanish	Central America	Agave Spp

Page	Remarks
98, 108, 117	See *Caraguata acanga*
98, 117	See *Caraguata guacu*.
98, 108	Usually identified with *Aloe vera* L, however that may be, it is *not* a *Furcraea* or *Euagave*
98, 108, 117	Perhaps a *Billbergia* or allied *Bromeliacea*, but at all events neither a *Euagave* nor a *Furcraea*
98, 108, 117	[illegible]
98, 108, 118	Rightly identified by Sloane with the common Penguin of the West Indian Islands There has been hopeless confusion with regard to these *Bromeliaceæ*, with the result that this *caraguata* has been credited with fibre it produces a fruit eaten in the Islands and in parts of S America but the fibre is reported to be worthless The *Bromelia acanga* of Linnæus (according to the Index Kewensis) was partly *Bromelia Pinguin* of the Sp Pl and partly *Karatas Plumieri*, E Morren See *Caroata*
98, 117, 118	See *Caballa* (1) This *Furcraea* is not naturalized or used so far in India, we have not recognized it even in gardens As a fibre producer it is believed to have some advantages over the other *Furcraeas* (See *Mauritius Hemp*) The name is probably the *Caroata assu* of the Tupi dialects in Spanish dress
97, 98 108	Martius identifies the plant of Marcgraf with *F cubensis*, but see *Caroata assu* He considers that this was the original Carib name for sundry *Agaveae* and *Bromeliaceae* and that Carib war canoes [illegible]
97, 98 108, 126	Cf *Bois de Mèche* Possibly two names are involved, one referring to a *Furcraea*, the other to a *Bromeliad*
98, 108	See *Caroa*
110	Meaning 'Thistle' or 'Artichoke' and referring to the prickly nature of certain *Euagaves*; applied to plants of the *Cactus* kind also.

Name	Authority	Language	Where used	Scientific determination
Caroa	Martius	Tupi Indian	Brazil	*Billbergia variegata*, Schult.
Caroata	Martius	Tupi Indian	Brazil	*Bromelia karatas*
Caroata Assu	Do	Do	Do	*Fourcroya gigantea* and *F cubensis*
Carow	Purchas (in Sloane)	Brazilian?	Brazil?	*Aloe Yuccaefolia*
Catecomer	Garcia	Malayalam	South and Western India	Aloe Sp
Catevala	Rheede Hort. Malab XI t 3	Do	S India	Do
Cauthaulay	Madras Exh Cat 1855	Canarese	S India (Mysore)	Aloe Sp
Cebar	Garcia	Arabic	Turkey Persia, etc	Aloe Spp
Cebu Hemp	Dodge	English	Philippines	*Musa textilis*
Century Plant	Squier (and others)	Do	North America (U S A)	*Agave americana*
Chaparay	Martius	Chayma Indian	S America (Orinoco Delta)	*Agave americana*
Chauga nara	Madras Exh Cat, 1857	Telegu	S India (Rajahmundry)	*Sanseviera Zeylanica*

Page	Remarks
98	Cf *Caraguata* (1) also *Caraguata* IV (of Piso) The plant of the younger Schultes is identified with *B speciosa* of Thunberg
98, 108	*Bromelia Karatas* (see Index Kewensis) is *Karatas Plumieri*, E Morren, a pineapple like plant of the Caribean region, reported to yield strong but soft fibre See, however, the preceding, *Ibera*, *Istle Mexican fibre*, *Silk grass*, etc, also *Caraguata* (1), and *Carow*
94, 95, 98, 108 117	This appears to be the *Caraguata guacu* of Marcgraf (see above), but Piso's plant is evidently neither of the *Furcraeas* named but *F tuberosa* Ait Confusion may have arisen over DeLaet's *Nequa metl*; Martius identifies the Tobago plant as *F cubensis*, and no doubt correctly but Marcgraf's *Caraguata guacu* was Brazilian.
98, 116	Sloane has included two sets ... *Yucca folius*, one series ... *Bromeliaceae*, another to ... *Furcraea* The "*Carow*" ... same as *Caroa* and referable to *Billbergia* or *Karatas*
113	Spelled *Catecomor* by Linschotten and Bauhin The first part is perhaps the same as that of the *Kadanaku* or *Catevala* of Rheede and may represent a 'Persian' form (Kadi or Kazi) given to local names derived from Kanta (thorn) —for the second part cf. *Kunwar* etc
113	From 'Kantewala' (i e, thorny)? See also *Kadanaku*
113	Doubtless a rendering of *Kattale*. See *Country aloes*
113	Cf *Acebar*, and *Azul*, also *Sabar*, etc
...	From *Cebu*, one of the Philippine group of Islands.
99, 111	Given to the garden kinds of *Agave* from a tradition started by Borel that the species first introduced into Europe flowered when the life of the plant attained a hundred years, and not earlier
96	Martius compares this with *Azul Champahra* (q v) *Chapara* in Spanish means a kind of Oak, but the true oaks (in Panama at least) seem to be called *Cerro*
77	Cf. *Saganara*, and *Sauga*

Name	Authority	Language	Where used	Scientific determination
Chelem	Perrine also Schott (in Engelmann)	Maya Indian	Central America (Yucatan)	Agave Sp
China grass (1)	Roxburgh	English	East India	*Sansevieria Zeylanica*
China grass (2)	Watt F D	Ditto	Cosmopolitan	*Boehmeria nivea* Hook and Arn
Chinguibito	Jackson	Spanish	Central America (Mexico)	*Agave americana*
Chini Kala banda	Ainslie Mat Med ii 160	Telegu	S India	*Aloe littoralis* Koenig
Chom	Dodge	Maya Indian	Central America (Yucatan)	*Bromelia Pinguin*
Chota Kanwar ka Patta	Ditto	Hindustani	Central Ind (Deccan)	*Aloe littoralis* Koenig
Chouca	Ditto	Spanish	Antilles	*Agave vivipara*
Chucumci	Engelmann	Maya Indian	Central America (Yucatan)	*Agave rigida* Mill.—var
Chucau	DeLaet (in Sloane)	Peruvian	S America (Peru)	*Aloe secunda* &c.

Page	Remarks
145	[illegible] but it is just possible that Perrine referred to the Euagave known as *A. decipiens*, Baker (K of this Bulletin) When the text was written we were not aware that Dr Perrine had introduced several distinct kinds of *Euagave* from Yucatan into Florida. [illegible]
77	Roxburgh conjectured that the China grass of his time, used for fishing lines, &c was obtained from this plant As Sir George Watt has already pointed out, we do not really know what the modern [illegible]
.	The *Rhea, Ramie, Ortie blanche,* &c
96 &c	Brandy made from the sugarcane (molasses presumably) as distinguished from *Agave* spirit, *Aguardiente de maguay,* which see, also *Aguardiente*
113	In Malayalam *Chenna Nayakam* Cf *Kadanaku* also *Jeeni kattalai*
145	Cf *Chucumci*
113	From the earlier accounts of Western India both the *Aloe* and *Agave* seem to have been called 'Kanwar,' i e, 'thorny,' the *Aloe* being the lesser, the *Agave* the greater *Kanwar* respectively
101, 107	[illegible] some Spanish or Carib name [illegible] t so far identified with Agave [illegible] ipara i but it is perhaps the [illegible] p 10) as figured by Oviedo
83 to 146	Not identified, reported by Schott as yielding a coarse fibre Cf *Chom*
85	Identified by De Laet with 'the Maguey of the Mexicans';—the *Aloe secunda* of Sloane is *A. americana* of Linnæus

Page	Remarks
98, 117, 145, 146	It is not clear what Martius supposed his *chilulqui* to be, he refers the fibre of Yucatan to several species such as *Furcraea cubensis*, *F tuberosa*, *Agave Jacquiniana*, *A lurida* *A Ixtle* At present the only species known to yield *Sisal Hemp* are *A sisalana* Perrine and *A longifolia* Engelmann
110	See *Maguay de Cocuy*
110	Ditto, and Cf *Coquise*
	The central cone of leaves in certain *Agaves* —in the species that yield 'Tampico fibre, the 'cogollo' is removed from the living plant to be treated for fibre
	A Mexican beverage made from certain species of *Agave*
110, 117	Mean ng not traced. Cf *Cocuyza*
117, 124	See the next also *Great American Aloes*
117, 124	Browne supposed his plant to be the same as the *A americana* of writers on Mexico but Martius referred it to *Fourcroya cubensis*, which the description will not suit, we think He lays stre s on its detergent properties See *Keratto*, also *Caraguata* (1)
9	The 'heart' or central cone of the Pulque yielding *Euagaves* at poling time which is removed to make the cavity for sap collection (*Cajete*)
96	Th s item is one in a l ng list headed *Agave* sp ' which however als includes '*Aloe perfoliata* ropes,' &c. Under Part I we have not mentioned the true aloe as a source of fibre because evidence of its present use is wanting Cf the next, and *Country aloes* (2)
96	As the same local list (f r Mysore) contains *Long Aloe* (*A vivipara*) and *Short Aloe* (*A americana*), and cauthaulay' is given as the equivalent the '*Country aloes*' fibre sl ould have been from a true aloe, but *Kattali* is now the name at Bangalore of an *Agave*
96	('Or *Cuthala nar*') If this was the same fibre as the *Country aloes* of 1855 it may have been from an *Aloe*; Royle supposed that it was from an *Agave* and the experiments have been quoted for *Agave americana* by subsequent writers. There seems no doubt that cordage has been made in S India with fibre from the true *Aloe* but not recently at least on a commercial scale

Glossary of local and commercial terms referring to the

NAME	Authority	Language	Where used	Scientific determination
COZTIC METL	Hernandez	Aztec	Central America (Mexico)	Agave Sp ?
CRAVATA	Martius	Brazilian	S America (Brazil)	*Agaveae* and *Bromeliaceae*, Sp
CRAVATA DE REDE	Do	Ditto	Ditto	*Bromeliaceae* ?
CROWIA	Miers	Indian dialect	S America (British Guiana)	*Ananas sativa*, Linn
CUBA HEMP	Guilfoyle	English	Australia	*Furcraea gigantea*
CUMABI	Rheede	Brahmin language	S India	*Aloe* Sp.
CURACA	Patrick Browne (also Sloane)	Spanish	Jamaica	*Agave* Sp
CURRATOW	Spon	Brazilian	S. America (Brazil)	*Bromelia Sagenaria*
CUTHALA NAR	Mad Exh Cat, 1857	Canarese	S India (Mysore)	...
CUTTALAY	Royle	Tamil	S India	Agave Sp
CUTTHALAY NAR	Do	Canarese		Do
DAGGER PLANT	Dr Bidie (1877)	English	S India	*Yucca gloriosa*
ELEPHANT AGAVE	Government Botanist Madras	Do.	S India (Tinnevelly)	Agave Vera Cruz Mill.

Page	Remarks
100	Martius suggests *Agave americana* but the description hardly fits any *Euagave* Perhaps a *Manfreda* Also given as *Macoztic Metl* and *Metl Coztli*
98	See *Caraguata* (1)
98	Meaning 'Net' or 'Hammock' *Caroata* See also *Curratow* and Cf *Reda aonas* of Ind a
98 154	Im Thurn ascribed the *Krowa* or *Crowia* fibre to a *Bromelia* but the plant at Kew has been identified by Sir Daniel Morris as the pine apple The word is presumably the same as *Caroa* Also spelled *Krowa* Cf *Caroa*
94 95	More than one species of *Furcraea* seems to have been tried in Austral a and one kind at least is grown on a cons derable scale in Queensland From the name this should be the *Furcraea cubensis* of Ventenat, but we do not know what the species of *Furcraea* really are that are grown or used in any of the countries interested
113	A Sanscrit epithet (referring to the goddess *Durga*) applied to the true *Aloe* See also *Catevala*
124	= *Coratto* See also *Keratto*
96	The scient fic name appears to be taken from *Arruda da Camara* whose plant is said by Martius to be called *Cravata de Rede* (*Ananas bracteatus* of the younger Schultes) Also called *Grawatha* according to Spon Cf also *Caraguata* (1)
96	T[illegible] plants were that supplied the fibre See *Country Aloes* (1) and (2) *Pooty Mungem* &c
96	i e *Kattalei* which is properly=true *Aloe* Cf *Kattali*
	Nar='fibre' in several of the S Indian languages apparently Cf *Cuthala Nar* and *Kattali*
78	Also called 'Spanish Dagger' 'Spanish Bayonet' etc in different countries.
83 86 147	(D) of Bulletin Probably a translation of '*Anai Kattalei*'

Name	Authority	Language	Where used	Scientific determination
Fnequen	Purchas (in Sloane)	Carib	America	Agave or Furcraea Sp.
Enuga Kala Bantha	Government Botanist Madras	Telegu	S India (Guntur)	Agave Vera Cruz, Mill
Enuga Kala Bonda	Ditto	Do	S India (Kistna, Nellore)	Ditto
Enuga Kala Bunda	Ditto	Do	S India (Kistna, Nellore, Kurnool)	Ditto
Ekikatali	Watt E. D	Canarese ?	S. India (Bellary)	*Agave vivipara*
Espadillo	Booth in Kew Bul Papers (Add Ser II) LXIV	Spanish	Central America	Agave, Spp ?
False Sisal	Kew Bul Papers (Add Ser II) LIX	English	*N. America* (Florida and Bahamas)	Agave decipiens, Baker
Fayal Lace	Dodge	Do.	N America, etc	*Agave americana*
Filo de pita	Liotard	Portuguese	Portugal	*Agave americana*
Fily Aguja	*De Lecluse*	*Spanish*	*Spain (Valencia)*	*Aloe americana*

Page	Remarks
97, 117	See *Henequen* and *Sisal Hemp*.
83, 86, 147	(D) of Bulletin *Cf Yenuga Kalabanda, etc*
83, 86, 147	Ditto Ditto Ditto.
83, 86, 147	Ditto Ditto Ditto
131	Probably Agave (J) *i e* our *A Wightii*
93	Mr Booth notes that the Brush fibre exported through Matamoras may be from the *Palma loca* (See *Palma*) or from various forms of the *Espadillo* We do not know to what plants *Espadillo* is applied, but it is perhaps a version of the Mexican *'Ixtle'* [see *Ixtle* (3) and *Mexican fibre* (1)] and applied in part to one or more *Euagaves*
77, 82, 83, 92, 106, 141 to 143, 146	This is probably one of the Yucatan *Euagaves* of which local (Maya) names are given by *Perrine, Schott* and *Martius*, and may be their 'Chelem' or 'Wild Henequen' It may further be the *Agave ixtlioides* of *Karwinski* and the *A rigida* (wrongly so named) of Engelmann (not of Miller) It has run wild in Florida, and was imported by mistake as *Sisal* to the Bahamas Known only in Botanic Gardens in India It is not in good repute as a fibre yielder, but it can readily be distinguished
96, &c.	A valuable kind of lace, formerly prepared in Fayal (Azores group) with thread prepared from the fibre of an *Agavea*, perhaps *A americana*, Linn or *A Vera Cruz*, Miller. The comparative abundance of one or more Agaves in the Atlantic Islands (including St. Helena) is remarkable, but their introduction is due probably to human agency, though the bulbils are believed to survive immersion in sea water.
96	This term is said to stand in Spanish also for the fibre of *'Agave americana'*
111, 114 126	See *Aloe americana* The plant of which De Lecluse took an offset from Valencia to Antwerp was very likely our D=*Agave Vera Cruz*, Mill., but that which the Dutch introduced to N. Europe (from the West Indies, or by way of the Far East) is [illegible] and, earlier, of [illegible] *...d needle.'* Cf [illegible] *...eedle* (above); [illegible] be fibre-yielding [illegible] ...nds the Dutch [illegible] probably a like signification.

Name	Authority	Language	Where used	Scientific determination
Fique	Dodge	Spanish	S America (Ecuador)	*Furcraea gigantea*
Ghaipat	Liotard	Hindustani (Deccani)	S W India (Ahmednagar)	*Yucca gloriosa*
Ghaymari	Do	Ditto	S W India (Ratnagiri)	*Agave vivipara*
Ghee Koomar	Roxburgh	Bengali	N India (Bengal)	*Aloe* Spp.
Ghi Kunvar	* Pharmacographia Ind	Hindustani	S W India	*Aloe vera*, Linn
Ghikwar	Stewart Panjab Plants p 232	Panjabi	India (Panjab)	*Aloe perfoliata*
Ghrita Kumari	Asiatic Researches, XI —156	Sanscrit	N India	Aloe spp
Giant fibre lily	Guilfoyle	English	Australia	*Furcraea gigantea*
Grass Hemp	Ditto	Ditto	Ditto	*Agave rigida*
Grass silk	Hakluyt's Voyages (in Sloane)	Ditto	America (probably New Granada)	*Aloe Yuccae folius*
Gratte Gratteuse	Kew Sel papers (Add. Ser. II) LXVI	French	Mauritius	...

Page	Remarks
94, 95	Dr Ernst identified this with the *Cocuyza* of Cumana, and both with '*Furcraea gigantea*'
78	Cf (for the vern name) *Bilati pat* and the following
131	Probably Agave (J); but the local name looks like a corruption of the following
113	See '*Ghrita Kumari*'
113	Tr [illegible]
113	Also called *Kwar Gandal*, 'gandal' being 'bulb,' and 'kwar'= 'kanvar'
113	This appears (see *Pharmacographia Indica* p 468, for origin and other forms) to be based on an older name of some plant, indigenous or anciently established, in Western and North Western India e g, *Aloe indica* of Royle If the true *Aloe* has been introduced on the coasts of India, it evidently had arrived before the *Agaveae*
94 95	This reads like a book name, but is quoted as actually in use by more than one authority It is not current in India See *Mauritius Hemp* also
146	Dr Guilfoyle evidently meant *A* [illegible]*isalana*, Perrine,=(G) of this Bulletin
116	Under this Latin name Sloane has quoted several different plants, one [illegible] (? *Sansevieria*) See *Silk Grass*, &c.
...	A machine for scutching the fibre of the Mauritius Hemp (*Furcraea* spp.)

Name	Authority	Language	Where used	Scientific determination
GRAVATA	Martius	"Lingoa Geral" (Brazil)	S. America	*Bromelia Karatas*
GRAWATHA	Spon	Do.	Ditto	*Bromelia Sagenaria*
GREAT ALOE	Balfour (Cyclopaedia)	English	S. India	*Fourcroya gigantea*, Vent
GREAT AMERICAN ALOES (1)	Cleghorn (Forests and Gardens of S. India)	Do	Ditto	*Agave americana*
GREAT AMERICAN ALOES (?)	[illegible] (Martius)	Do.	Jamaica	*Fourcroya cubensis* Haworth
GREEN ALOE	[illegible]	Do	S. India (Mysore)	*Agave vivipara*
GREY ALOE	*R. E. P.	English	India	Agave Vera Cruz Mill
GUAMARA	Dodge	Tupi Indian	S. America (Brazil)	*Karatas Plumieri*
GUAPILA	Loss	Mexican	Central America (N. Mexico)	*A. falcata*, Engelmann
GUL SHABO	R. E. P.	Persian	N. India (Pathankot, Panjab)	A. Cantala Roxb
HAMPE	..	French	France and French Colonies	..
HANE A CANE	Martius	English	America	Agave and Furcraea spp.

* Reporter on Economic Products to the Government of India.

Page	Remarks
93, 98	See *Caraguata* (1), *Caroata*, &c
98	See *Curratow*
96	See the next.
96, 124	W [illegible] have [illegible] days [illegible] plant [illegible] may [illegible], but Cleghorn's use is that of most English horticulturists
97, 98, 108, 117 124, 121	For other 'English names,' see the preceding and the next, also *Country Aloes, Grey Aloe, Hedge Aloe, Hill Aloe, Long Aloe, Short Aloe, Wild Aloe, Seaside Aloe*, etc
121	No doubt a *Furcraea* (see *Sime Kattale*) The Madras Exhibition Catalogue for 1855 includes fibre from Cuddapah ascribed to '*Agave viridis*' There is no such species known to botanists and the fibre probably was from one of the *Furcraeas* The leaves of the Indian *Furcraeas* are usually of a lighter shade and brighter green than those of the *Euagaves*, and the name recalls the 'Aloes Vert' of the Mauritius—a term not in use in Europe apparently, where '*Green Aloes*' since the days of Rauwolf's Travels (Book III, p 315) has referred to a true *Aloe*
83, etc	Referring to the 'grey' or 'blue' (glaucous) tint that is usually conspicuous in (D) of this Bulletin
93, 98	Cf *Istle* Dr Ernst identifies the (Venezuelan?) product with this name as 'Bromelia Pinguin' '*Guama*' again, is from a totally different order of plants (*Lonchocarpus* Nat Ord. *Leguminosae*)
...	Mr Rose regards Engelmann's '*falcata*' as perhaps identical with *A striata*, Baker, which is Mr Booth's 'Palma loca' See *Mexican fibre*, etc
	[illegible] aturalized [illegible] *eedle* (2) [illegible] like those [illegible] Burkill). [illegible] the Tube- [illegible]
79	The 'pole' or scape, *i e*, flowering stem,—of *Agaveae*
97	According to Martius a corruption of Henequen We have not encountered it.

NAME	Authority	Language	Where used	Scientific determination
HATHI CHINGAR	Mukerji also Watt E.D	Hindustani	N India (Oudh)	*Agave vivipara*
HATHI SENGAR	Watt E.D	Ditto	India	*Agave americana*
HATTI HEMP	Bernardin (in Dodge)	English	N America ?	*Furcraea gigantea*
HEDGE ALOE (1)	Madras Exh Cat 1857	Do	S W India (Poona)	Agave Sp. ?
HEDGE ALOE (2)	Cameron (Bangalore Cat)	Do	S India (Mysore)	*Aloe barbadensis,* Mill.
HENECHEN	De Laet (in Sloane)		Antilles	*Aloe Yuccae foliis*
HENEQUEN (1)	Oviedo (in Sloane)		Do	Ditto
HENEQUEN (2)	Martius	Haitian	Antilles (San Domingo)	Agaveae spp.

Page	Remarks
131	*Hathi*=elephant; *Chingar* probably means a 'claw,' or 'thorn;'—Mukerji does not give the locality
95	Cf the preceding
94 95	From an article by Mons M F Fasio at p 342 Journ d Agriculture Tropicale No 41 1904, it appears that in Algeria where *Agave* is [illegible] so far as [illegible]
96	Possibly *Agave* (*D*)
96	C G Hope is quoted for the identification
116	See the next
Do	Sloane cites *Oviedo* without question; also *Purchas' Voyages* Martius will have it that Oviedo's *Henequen* was n [illegible] and this may be so, but Sloane's *Aloe Yuccae foliis* [illegible] the Henequen of early English travellers on the mainland was pretty certainly one of the Yucatan *Euagaves* which [illegible] cultivated for the fibre have a very Yucca like aspect For other references by Sloane see *Anana de Pite Carow* and *Grass silk* [illegible]
97, 117	Martius supposes that the *Henequen* and *Iste* of the Islands were derived mainly from species of *Furcraea* and that [illegible] these with the [illegible] the mainland [illegible] belonging proba[illegible] truth in this [illegible] Yucatan the [illegible] Mexico and [illegible] rather to be [illegible] Mr Dodge remarks that 'Nequen' was a native Mexican word and the dominant races who maintained the cultivation of different *Euagaves* both for meal and cordage came from the N West or South and not from the Islands Whatever may have been the ancient history of the word it is now applied [illegible] the chief markets to the *Yucatan* fibres and to those of the *Sisal* group [illegible] particularly See also *Sisal Hemp* etc

NAME	Authority	Language	Where used	Scientific determination
HATHI CHINGAR	Mukerji, also Watt E D	Hindustani	N. India (Oudh)	*Agave vivipara*
HATHI SENGAR	Watt F D	Ditto	India	*Agave americana*
HATTI HEMP	Bernardin (in Dodge)	English	N. America ?	*Furcraea gigantea*
HEDGE ALOE (1)	Madras Exh Cat 1857	Do	S W India (Poona)	Agave Sp ?
HEDGE ALOE (2)	Cameron (Bangalore Cat)	Do	S India (Mysore)	*Aloe barbadensis*, Mill.
HENECHEN	De Laet (in Sloane)		Antilles	*Aloe Yuccae foliis.*
HENEQUEN (1)	Oviedo (in Sloane)		Do	Ditto
HENEQUEN (2)	Martius	Haitian	Antilles (San Domingo)	Agaveae spp.

Page	Remarks
89, 144, 145	In 1834 Dr Perrine, U S Consul at Campeachy, submitted a report to his Government on the fibres of the Yucatan Peninsula, in which he described the '*Henequen*' as fibre made in Yucatan from different kinds of *Agaveas*, of which he selected the 'Yashqui henequin' as the best for cultivation in his own country In 1838 he introduced different species from the Peninsula of *Yucatan* to that of *Florida*, where his life was sacrificed during an incursion of the Indian tribes from the interior Since his time '*Henequin*,' or, as it is now usually spelled, '*Henequen*' has become a fibre of first rate importance in several countries, and Perrine's selected species has been introduced successfully into Bengal and Mysore in India. It is said that other staples have been largely mixed at the ports of the Gulf of Mexico with that got from the *Euagaves*, but the term '*Henequen*' is still properly applicable to the best qualities of Yucatan *Euagave* fibre (See also *Sisal Hemp*) It must be remembered at the same time that the sort mostly grown in that Peninsula is not Perrine's '*Sisalana*' though closely resembling it For outside countries Perrine's is believed to be superior to it
78	This is no doubt quite correct as regards some local usage Under *Aloe Yuccae foliis* Sloane quotes Hermann and other authors who had intended either forms of Yucca, or of the small *Agaves* that have 'thready' leaf-margins, none of which have yet been tried on a market scale in India
146	This seems to be well known and appreciated in parts of Australia
109	Oviedo's actual spelling See Henequen (2) for details
146	So spelled, apparently, in Perrine's original report which we have not seen, nor his articles in *Silliman's Journal* We have followed Engelmann as regards the spelling in this case Cf. *Henequen* (3), etc
81	*Bulbils* or young plants developed on the parent branches in the place of seeds by a process of proliferous germination in *Euagave* and *Furcraea*
91, 131	We include these and other terms, though the books are somewhat out of date, because they are not unlikely to recur locally in the course of business
109	See *Coztic Metl* (We have not been able to give more than a few of the names in Hernandez)
...	Cultivated near Bolanos in the state of Jalisco for fibre Species not determined Identified with the *Bastard Tequila* (which see also *Tequila*)

Name	Authority	Language	Where used	Scientific determination
Ibera	Kew Bul Papers (Add Ser II) XXXVIII	Brazilian	S. America (Paraguay etc)	*Bromelia* sp
Imbira branca	Martius	Tupi and other native Indian languages	S America (Brazil etc)	*Funifera* sp
Ixtale	Squier	Spanish	Central America (Mexico)	*Bromelia sylvestris*
Ixtle (1)	Do	Do	.	Ditto
Istle (2)	Temple in Journ Soc. of Arts, Vol V p 125	Mexican	Central America (British Honduras)	Ditto

Page	Remarks
93, 98	See *Caraguata* (1) and the following
	From the works of Humboldt and Martius it appears that several different kinds of fibre known in S America under variations of the word *Embira*, [illegible] (e g, *Macembira*) are [illegible] *Funifera* (Nat. Ord [illegible] *Apaiba* (N O *Tiliac* [illegible] 'Embira' fibres are apt [illegible] those of the *Agaveae*. [illegible]
93, 98	A patch of *Istle* cultivation, or *Pinuella* farm, so called in the country bordering on the Gulf of Campeachy (see the next and *Ixtle*)
93	[illegible]
93	T [illegible] there be only one species in the tract mentioned), we have no immediate knowledge, but Sir D Morris' matured opinion points to the *Karatas Plumieri* of Morren—*Nidularium Karatas* of Lemaire (see the preceding, *Caraguata* (1) and connected references) This plant is identical, as we suppose, with a Bromeliad which is established in the Sibpur Garden and seems very much at home in its surroundings but this is not known to have been raised on a commercial scale as yet in India This staple would probably have taken better hold in the U S A and in [illegible] apple; *Pinuella* represents one or more wild pineapples or fibre-yielding Bromeliads.

NAME	Authority	Language	Where used	Scientific determination
IXTLE	Dodge	Mexican	Central or S America	
IXTILLI	..		Ditto	*Agave* sp
IXTLE (1)	Squier	Mexican	C America (Isthmus of Nicaragua, etc)	*Bromelia sylvestris*
IXTLE (2)	Spon	Ditto	C America (Mexico)	*Nidularium Karatas*
IXTLE (3)	Rose	Ditto	Ditto	Agave sp
IXTLE MESCAL	Dodge	Ditto	Ditto	*Agave Wislizeni*
IXTLI (1)	..	Ditto	Central America (State of Vera Cruz)	Karatas Plumieri, Morr ?
IXTLI (2)	Martius	Maya Indian ?	Central America (Yucatan)	*Agave Ixtli*, Karwinski

Page	Remarks
	= *Ixtle?*
83, 84, 101, 140, 141, 147	Evidently *Ixtle*: applied to an *Agave* said to be naturalized in Burma, if that be the same with one cultivated at Saharanpur in N W India—Agave (A) of our list which again is very like a form cultivated at Kew from the Turks or Caicos group of islands (in the Bahamas) When Parts I and II were written we were not aware that Perrine had introduced more than the one ... of *Agav* ... g this plant without name pending further information but in the light of the above it evidently merits examination as a source of fibre It is not unlikely that the *Agave Ixtli* of Karwinski from Yucatan received its specific name on the supposition that it was the fibre 'Istle' of the country, this, if not actually the same as Baker's *Agave decipiens* (the false Sisal), is very near to it, and may be the 'wild' kind of Engelmann Perrine may, we think have imported (among others possibly)—(i) *A sisalana*=(G) (ii), *Agave* (A) and (iii) *A. decipiens* Baker=(K), and if there is or was an Euagave known as *Ixtle* in the Maya country, our A and not Karwinski's plant perhaps represents it. How it has become naturalized in Burma remains to be discovered
93 98	Possibly in part the same as Temple's *Istle*, i e, *Istle* (2) Major Barnard (U S A) reported on it from the Isthmus of Tehuantepec (Gulf of Campeachy) but diverse products were perhaps included under the one name, at least one being probably an *Agave*
93	See *Istle* (1), ... contributor ... and Nicarag ... Sinaloa, Coa ...
93	The species of *Agave* which yield '*Tampico fibre*' (chiefly used in brush making) belong for the most part to a different section of the genus from the *Euagaves* None have been so far planted in any part of India except here and there in gardens See also *Broom root, Brush fibre* (1) and (2), *Mexican fibre, Tampico fibre* and *Reju*
98	This belongs to the *Euagave* section, but has nothing to do with the *Mescal* of the southern parts of Mexico It is practically unknown in India.
93	A spelling (more correct perhaps) of *Ixtle*, which see, also *Istle* (1) and (3)
140	See *Ixtilli* and *Yxtli*

Name	Authority	Language	Where used	Scientific determination
Ixtly	...	Aztec ?	Central America (Mexico)	..
Jafirabad Aloes	Pharmacog. Ind.	English	India	Aloe, sp.
Jamaica Keratto	J. G. Baker	Do	England	*Agave Morrisii*, Baker
Jangli anānas	Balfour (Cyclopædia)	Hindustani	India (Bengal, &c.)	*Agave americana*
Jangli anás	Pharmacog. Ind.	Ditto	S.-W. India	Ditto
Jangli Kuntala	Watt E. D	Ditto	India (Guzerat)	*Agave americana*, Linn
Jenni Kathalai	Govt Botanist, Madras	Tamil	S India (Salem)	Agave Vera Cruz, Mill.
Jenequen	Schott (in Engelmann)	Maya Indian (in Spanish form)	Central America (Yucatan)	*Agave* sp.
Jungli	Dodge	Bengali	India (Bengal)	*Agave americana*
Kadanaku	Rheede	Malayalam	S India (Malabar coast)	Aloe sp.
Kadi	Forskohl Fl. Aeg. Ar p. 172.	Arabic	Arabia Felix Yemen.	*Keura odorifera.*
Kalabanda (1)	Pharmacog. Ind.	Telegu	S. India	*Aloe vera*, Linn.
Kalabanda (2)	Govt. Botanist, Madras	Tamil	S India (Nellore, Cuddapah)	Agave Vera Cruz. Mill.
Kalabantha	Balfour (Cyclopædia)	Do.	S India	*Agave americana*
Klabonda	Govt. Botanist, Madras	Telegu	S India (Anantapur, Nellore, Bellary)	Agave Vera Cruz, Mill

Page	Remarks
..	A variation of *Ixtle* See *Istle* (I) and *Yztli*
113	A sort of bitter aloes made at *Jafirabad* in Guzerat by families claiming African descent
91	From the description this Euagave would seem near to our *Agave* (*H*), but we think the Indian plant is allied rather to the '*Sisalana*' group including (E) and (F), and a likely fibre producer. See *Keratto* also.
96	Meaning 'wild pineapple' We have not met with the expression
96	Cf the above, also *Nanas utan*, *Reda aonas*, etc
96	Cf *Bara Kanwar*, *Kunvar*, etc also *Gritha Kumari*: the species may be (D) = *A Vera Cruz*, Mill.
86, 147	From *Jin* (a demon)? but cf *Chini Kalabunda*
144	Another spelling of *Henequen*, which see We do not know precisely what Schott meant by the term, not having his original report before us Engelmann ascribes all the best Yucatan fibre to '*A rigida* Miller,' and its supposed varieties, *sisalana* and *longifolia*, but Schott seems to have relied a good deal on local accounts, and his *Jenequen* may have included fibre from other sources See *Sisal Hemp* also
96	'Ananas' (or the like) has evidently dropped out in printing See *Jungli ananas* above
113	Sometimes spelled Kadenaku The first two syllables are probably [illegible]
95	
96	We have not been able to discover the meaning of this widespread name,—but see *Kalbanda* and *Klamanda*
87, 147, &c	Cf the preceding Many changes have been rung on the spelling
96	= the preceding
87, 147	No doubt a variant of *Kalebanda*

Name	Authority	Language	Where used	Scientific determination
Kalabunda	Ainslie Mat Med 1813	Telegu	S India	Aloe sp
Kalabuntha	Liotard?	"	S India (Madras)	*Aloe perfoliata*
Kala Kantala	Balfour Cyclopædia	Sanscrit	India	*Agave americana*
Kalbanda	Fallon (Dict)	Hindi	India	*Aloe perfoliata?*
Kalkali	Do	Hindi (Tirhut dialect)	N India (Bengal)	Ditto
Kalnan	Dodge		India	*Agave sp*
Kalnar	Liotard	Hindustani (Deccani)	India (Bombay)	Ditto
Kan	Dodge	Maya Indian	Central America (Yucatan)	*Agave rigida*
Kantala	Pharmacog Ind.	Sanscrit	India	*Aloe vera, Linn*
Kantal		Bengali	N. India (Bengal)	*Artocarpus integrifolia, Linn*

Page	Remarks
113	It seems almost as if in Telegu *Kalabanda* were the true aloe, in Tamil the *Agave*.
113	The first fibre products from 'Kalabuntha' sent to Europe from Madras (by Dr Hunter) were ascribed to a true aloe Later *Agave* fibre was sent from the same quarter under the same name of *Kalabantha*
96	Cf *Kalabanda* and *Kuntala*
96, 113	'Kal' in 'Hindi,' etc '=evil,' 'bastard,' 'degenerate,' etc. 'Banda' in Hindustani=parasite or epiphyte (e g Loranthus) See also *Klamanda*, of which possibly *Kalabanda* may be a corruption
96, 113	See the preceding
	Perhaps taken from the following
...	Cf. *Kalbanda, Kalkali*, and see *Nar*. Reported from the S. Mahratta country
143	Evidently one of the *Euagaveæ* of Yucatan or a *Furcraea*.
113	An epithet of the true *Aloe* meaning '*thorny*' Cf. *Catevala, Kadanaku*, etc, and see *Cantala, Kathal, Kuntala* and the following
	See *Kathal* This was also possibly a *Kantala* The jack fruit is perhaps only introduced in N India, but very anciently. The pronunciation and spelling vary; this has both the vowels fairly broad (accented)

NAME	Authority	Language	Where used	Scientific determination
KANTALA (1)	Stewart (Panjab Plants, p 232)	Panjabi?	Panjab?	*Agave Kantala*, Roxb
KANTALA (2)	Watt E.D	Sanscrit	India	*Agave vivipara*, Linn.
KANTALA (3)	Prain (Vegetation of Hughli Howrah, and 24 Parganas)	Bengali	Bengal	*Agave Vera Cruz*, Mill.
KARAO	Moerman, (The Ramie etc)	Japanese	Japan	*Boehmeria* sp.
KARAGATA	De Laet (in Sloane)	Carib?	Antilles	*Ananas sylvestris, Brasiliana*, Herm ?
KARATA	Du Tertre (in Sloane)	French	Do.	Ditto
KARATA SAUVAGE	Do.	Do.	Do	*Aloe Yuccae folio*

Page	Remarks
130	[illegible]
100, 127 133, 136	U [illegible] it as a new species Later he seems to have referred it to '*A. americana*' Ultimately it was published as *A. Cantala* Whether it was the *Kantala* of the *Asiatic Researches* is doubtful Voigt and Colebrooke very possibly supposed that Wight's plant was a [illegible] *A.* *Cantala* Roxb.
86, 88	Our (D) = *A Vera Cruz*, Mill '*A lurida*' of the Sibpur Garden (*not* of Gawler and others) may have been the plant identified by the Pandits who assisted Sir William Jones and his contemporaries in their endeavours to identify plants mentioned in the Hindu Classics and Pharmacopœia, but we do not think it is the fibre plant on which Roxburgh reported, which was, we consider, Agave (E), i.e., *A Cantala*, Roxb.
	Cf *Carao*, *Carow*, and *Caraguata* (1)
93	Sloane goes on to identify this with the Jamaica *Penguin*. Hermann's plant was very likely the 'Bromelia sylvestris' of later authors; but if it yielded fibre would more likely be *Karatas Plumieri*, Morren, than *Bromelia Pinguin*, Linn. See *Bromelia pita*, *Caraguata acanga* and *Caraguata* (1), also *Istle* (1) and (2) and *Silk grass* for the confusion under this set of names of *Bromeliaceous* fibre plants with *Furcræa* and *Agave*.
113, 117	'A fruit,' and therefore no doubt rightly identified by Sloane with the Jamaica 'Penguins.'
113, 117	A 'pita' without prickles which Sloane thought might be Hernandez' *Pati* and Oviedo's *Henequen* (i e., a *Furcraea* or a *Sisal Agave*) See *Pita* also.

NAME	Authority	Language	Where used	Scientific determination
KAROON KUTTALAY NAR	Madras Exh. Cat. 1857	Tamil	S. India (Madras)	*Agave* sp.
KARUN KATHALI	Govt Botanist Madras	Do.	S. India (Dindigul)	Agave Vera Cruz, Mill.
KARUN KATTALAI	Do	Do	S India (Coimbatore, Tinnevelly)	Ditto
KATAR	Fallon (Dict)	Panjabi	Panjab	*Artocarpus integrifolia*
KATHAL	Do	Hindi	N India	Ditto
KATHALAI	Watt E D	Tamil	S. India	*Agave americana*, Linn
KATHALAY	Balfour (Cyclopædia)	Do.	Do	*Agave vivipara*, Linn
KATHALI	Govt Botanist Madras	Do.	S India (Cuddapah, Dindigul)	Agave Vera Cruz, Mill
KATTAL	...	...	..	...
KATTALA	Govt Botanist Madras	Telegu	S India (Bellary)	Agave Vera Cruz, Mill.
KATTALAY	Ainslie Med Mat (1826).—1-10	Tamil	S India	*Aloe perfoliata*, Linn.
KATTALI	Cameron (Bangalore Cat.)	Canarese	S India (Mysore)	*Agave americana*, Mill.

Page	Remarks
95 113	Exhibited in 1855 from the same district but source of fibre not named Cf the next
86 147	= *Agave* (D)
86 147	= Do
	See *Kathal*
	Pronounced in Bengal with the last vowel broad (See *Bengal* [illegible] … and the current use of *Kantal* is for *Artocarpus*
96	Usually in combination with a qualifying term such as 'Anai' etc Cf *Kattali* etc
96	Cf *Cathaulay* *Country aloe* (1) and (2) and *Kattali* but also *Kattalay*
86 147	Cf *Kathali* *Kattala* *Anai Kattalai* etc
	See *Kathal*
86 147	Cf *Kathali* and see also *Kantala* and *Kathal*
113	Cf the next also *Kathalay* *Kathal* etc
96	Mr Cameron gives the Carnatic name for 'Aloe litoralis' as *Lolisaraganda*

NAME	Authority	Language	Where used	Scientific determination
KATTALI FIBRE	Madras Exh Cat 1855	English	S India (S Arcot)	*Agave* sp
KATTALY	Do 1857	Canarese	S India (Madura)	*Agave* sp
KEA	Roxburgh (Hort Beng)	Bengali	Bengal	*Pandanus odoratissimus* R
KEA KANTA	Do	Do	Do	*Pandanus foetidus* R
KENDA	Watt E D	Hindustani	Do	*Pandanus odoratissimus*, Willd
KERATTO		Spanish	W Indies	Agave sp
KETAKI	Fallon (Dict)	Pali	S India	*Pandanus odoratissimus*
KETGI (1)	Do	Hindi	India	Ditto
KETGI (2)	Watt E D	Do	Central India (Deccan)	*Agave americana* Linn
KETKI (1)	Fallon (Dict)	Do	India	*Pandanus odoratissimus*
KETKI (2)	R E P Govt of India	Do	Central India (Berar)	Agave Wightii (of this Bulletin)
KETKI (3)	Liotard	Guzerati	Western India (Kathiawar)	*Pandanus odoratissimus*
KETUKEE	Roxb (Hort Beng)	* Sanscrit*	India	Ditto
KEORA	Do	Bengali	Bengal	Ditto
KEORAKANTA	Do.	Hindustani	Do	Ditto
KHETKI	Watt E D	Do	N India (Oudh)	*Agave vivipara*, Linn
KIKANORA MATRA.	Govt Botanist Madras	Telegu	S India	Agave Vera Cruz, Mill

* An unpublished coloured drawing however made under the supervision of Buchanan (afterwards Hamilton) and now preserved at Kew gives *Ketki* as a vernacular name for a plant which is unmistakeably A *Cantala* Roxb

Page	Remarks
95, 113	Cf *Kathalay*, *Kathali*, *Kattalay*, etc
95, 113	Do. Do
	Cf *Ketaki*, *Keura*, *Kia*, *Koyan*, etc, and the next Dodge spells this '*Keya*' Called '*Kekel*,' '*Keker*' in Malaya
...	For other names and scientific designations see Bengal Plants, p 1101 Species of *Pandanus* are native in different parts of India, but those usually found in hedges or near temples in Bengal were probably imported from Malaya
.	See *Palkande* Probably a dialectic form of *Kanta*
117, 128	Originally *Caraguata* (which see) but in Jamaica and other West Indian Islands now commonly applied to species of *Agave* and *Furcraea*
..	Cf the next, *Ketki*, *Ketukee*—and *Ketgi*
	Cf the preceding and following
96	See the next also, and *Banskeora*
	Cf *Ketaki*, etc
...	In the drier parts of India *Agave Wightii* (J) has made itself at home, and has acquired fairly constant local names, such as *Ketki* and *Banskeora* *
	Fibre of leaves proposed as a paper stock, identification doubtful possibly an *Agave*
.	= *Ketaki*
..	[illegible]
...	[illegible]
91	Probably (J) brought from the Deccan and planted about forts and settlements by the *Rohillas*, as in the *Ganges Doab*
86, 147	'*Matta*,' '*Motta*' or '*Matka*' is frequent in the names of *Agaves* in S India (from Mata=Devi?); for '*Kasora*,' cf. *Kanur*, *Kunvar*;—and for the first syllable *kea*, *ghikomar*, etc.

NAME	Authority	Language	Where used	Scientific determination
KITHALI NARA MATHA	Govt. Botanist Madras.	Telegu	S India (Ganjam)	Agave Cantala, Roxb.
KITHANARA	Do		S India (Godavari)	Ditto
KITKI	Stewart (Panjab Plants, p 232)	Hindi ?	Panjab	*A. Cantala*, Roxb.
KITTA NAR	Madras Exh Cat 1857	Telegu	S India (Rajahmundry)	*Agave* sp.
KITTANARA	Balfour (Cycl pædia)	Tamil	S India	*Agave Cantala* Roxb
KITTANARA MATTALU	Govt Botanist Madras	Telegu	S India (Godavari)	Agave Vera Cruz, Mill
KITTAULEE NAR	Madras Exh Cat 1857	Tamil	S India (Vizianagram)	*Agave* sp.
KLAMANDA	Do	Canarese ?	Do	Do
KOOMAREE		Hindi	India	Aloe spp.
KOYAN	Mukerji (Descr Cat Ind, Prod Amsterdam etc 1883)	Bengali	Bengal	*Agave americana*
KUNTALA	Roxburgh (Hort Beng)	Sanscrit	India	Agave Cantala, Roxb
KUNWAR	Ainslie	Deccani	Central and Western India	*Aloe* sp
KUTTALAY	Ainslie Mat Med (1826), ii—160	Tamil	S India, Madras	Do.

Page	Remarks
87, 147	Cf the preceding, but 'Nara' is here perhaps 'fibre'.
87, 147	Cf. *Anakystha*
100, etc	Stewart cites 'A vivipara Royle' as a synonym, by which he meant possibly A vivipara of *Wight*=(J) but from a coloured drawing made under the auspices of Buchanan (afterwards Hamilton) preserved at Kew it appears that the plant known to Buchanan as '*Ketki*' was A. *Cantala* Roxb
147	Cf the next, also *Kithanara*
147	This is probably correct Cf *Kithanara*
	Cf *Kithanara*, etc.
80, 147	[illegible] other Indian species
86 147	Cf *Munda* and *Kalamanda*, also *Kalabanda*
113	See '*Cumari*' The correct transliteration is *Kumari*.
96	Probably from the local name of *Pandanus fascicularis*, Lam (Bengal Plants, p 1101)
129, 130, 136	Cf. *Kantala* and *Cantala*.
113	In Guzerati 'Kuvara' or 'Kumara'.
...	Cf. *Bara Kanwar*, *Catecomer*, etc.
113	[illegible]

NAME	Authority	Language	Where used	Scientific determination
KUTTHALAI	Brown and Wood	Tamil	S. India, Madras	*Aloe sp.*
KUAR GANDAL	Stewart (Panjab Plants, p 232)	Panjabi	Panjab	*Aloe indica*, Royle
KYEE	Ainslie	Deccani	S India	*Agave vivipara*, Linn
LAFFA	Et. de Flacourt (in Sloane)	French	Malagascar	*Aloe Yuccae folius ?*
LAL MURGA	Piddington (Index)	Bengali	Bengal	Celosia cristata, Linn.
LANGUE BOEUF	Dodge	French	Antilles	*Furcraea cubensis*
LARGE ALOE FIBRE	Mad Exh Cat 1855	English	S. India (Tinnevelly)	*Agave sp*
LECHEGUILLA	Miss Garden Rept, 1890 (also Dodge, Rose and others)	Spanish	Central America (Mexico)	Agave sp.
LIDA BOAYA	Rumpf	Malay	Moluccas, &c.	Aloe sp
LILY FIBRE	Indian Agriculturist, Dec. 12, 1891	English	England	*Agave americana*

Page	Remarks
113	When used without any qualifying addition this seems generally to refer to *Aloe* and not *Agave*; but see *Kattali*
113	Means "Thorn—onion" the first part is = *Kunwar*, &c, above
95	'Kyre,' probably is from *Keora* or *Keura* usually in N India given to Pandanus Perhaps this word is the same as coir' and means simply 'fibre' Old writers speak of a *Quera*' as yielding fibre near the Portuguese factories Ainslie attributes his kyre' which was a 'strong and useful cordage' to an *Agave* most likely (J) of this Bulletin See also *Mellis Kyre* and *Kadi*
77	This looks like one of the African names of *Sanseviera* (at Angola Ifé = *S cylindrica*, Bojer) with the French definite article prefixed Flacourt was Governor of Madagascar in the 17th century and in Bojer's time *S cylindrica* was cultivated in the Ile de France as a native of Zanzibar See also *Anana de pite, Bowstring Hemp* and *Pitte Ahetz*
	Spon states that a valu [illegible] but as Sir George W [illegible] required' *Celosia cr* [illegible] ornamental plant [illegible] with autumn crops throughout N India Spon's authority may have been misled by a vernacular name Cf *Murga Moorva* &c *Lal Murga* evidently means 'Red Cockscomb'
94, 95	See *Cabuya, Henequen* (1) and (2), *Mauritius Hemp*, &c
95, 96	Probably (D)
99	A [illegible]
113	'Crocodile's tongue' as distinguished from '*Nana boaya*' (crocodile pineapple) which we take to be *Agave Cantala* Roxb = (E) or a very closely allied species Blanco gives 'Lidang boaya' as a name of *Aloe* in the Philippines
99	The article quoted states that this is a white lustrous and superior kind of fibre used in brush making which is obtained from *Agave americana* in Mexico and might be abundantly produced in India; but see *Aloe fibre Mexican fibre* (1), and *Tampico fibre*

Name	Authority	Language	Where used	Scientific determination
Long Aloe (1)	Rice (Mysore Gazetteer)	English	S India (Mysore)	Agave sp.
Long Aloe (2)	Madras Fib Cat 1855	Do.	Ditto	*Agave vivipara*
Macembira	Martius	Tupi Indian	S America (Brazil &c.)	*Bromelia laciniosa, Mart.*
Macoztic Metl	Hernandez	Aztec	Central America (Mexico)	Agave sp.
Madre Pulque	Martius (and others	Spanish	Ditto	Agave atrovirens *Karwinski* and other species
Magay	Edwards	Filipino	Philippines	Agave sp
Magguay	H B K	Do	Ditto	*Agave americana*
Maguay de Cocuy	H B K	Spanish	S America (Venezuela)	*Yucca acaulis, H B K*
Maguay de Cocuyza	Do.	Do.	Ditto	Ditto
Magueb	Edwards	Filipino	Philippines	Agave spp
Maguei	Jacquin (Sel. St. Amer)	Spanish	Cuba	*Agave cubensis*
Magueis	Hakluyt	Do	Central America (Mexico)	Agave spp

Page	Remarks
131	Probably Agave (J) i e, our *A Wightii* (See the next and *Skert Aloe*).
131	Ditto ditto ditto
98	Martius says Maci='hammock' and Embira='string' *Bromelia lacinosa* Mart is believed to be=*Karatas Plumieri* Morren, for which see *Istle* (1) and (2)
109	See *Coztic Metl*
140	The thickened dregs of the sap of the *Pulque Agaves* left in the 'cajete' or cavity of the plant —added to the sap after it has been drawn off to promote fermentation
99	=*Maguey*
99	Humboldt in his own writings has noted clearly that the *Maguey* he saw in Mexico was planted or cultivated and that there were several kinds not belonging to the genus *Agave* exclusively Kunth in dealing with the botany of Humboldt's travels described only one *Agave* which he referred (erroneously as appears from the works of Rose and others) to the *A americana* of Linneaus (See also *Pulque Tequila* &c) and stated that this occurred throughout Central America as far N as Florida The native place of *A americana* Linn, is not known but it seems doubtful if it is found except in gardens even in Mexico See also *Maguey*
98	So called at *Caraccas* (at that time) and used for fibre
98	At *Cumana*, and used similarly Cf. *Coquise*
99	This is a provincial spelling in the Philippines Other versions in the same Islands are *Amaguev* (which see) '*Maguie*, *Maguev*, and *Maguı* The plant or the fibre is called also in some parts '*pita*' Cf also *Maguı*
94 95	*Maguei* appears in Hernandez both for the cider 'Metl,' and for a species which does not seem to be a fibre *Agave* Jacquin says his Maguei is common in Cuba and used as a detergent. It is a *Furcraea*
109, 110	The Maguey is so called by early English travellers. Cf. *Lagueyes* (2)

Glossary of local and commercial terms referring to the

NAME	Authority	Language	Where used	Scientific determination
MAGUEY (1)	Oviedo	Spanish	Antilles	*Agave cuspara*
MAGUEY (2)	Do.	Do.	S. America	*Agave americana*
MAGUEY (3)	Peter Martyr (in Martius, also in Danielli)	Haitian	Antilles (Haiti)	Agave sp.?
MAGUEY (4)	Squier	Spanish	Central America (Mexico)	*Agave mexicana*
MAGUEY BLANDO	Dodge	Do.	Ditto	*Agave Salmiana*
MAGUEY CIMARRON	Schiede (in Linnaea)	Do.	Ditto	*Agave americana*
MAGUEY DE TEQUILA	Dodge	Do.	Ditto	Ditto
MAGUEY MANSO	C. Bení (in Danielli)	Do.	Ditto	*Agave Maximiliana* P. & J. Blasquez.
MAGUEY MANSO FINO	Dodge	Do.	Central America (District of Mexico)	*Agave americana*
MAGUEYES (1)	Oviedo	Spanish	Central or S. America	

Page	Remarks
121	Martius says that there is a drawing with the supplement of *Oviedo* which shows as the original *Maguey* a smaller plant than either *A americana* or *Furcraea cubensis* and suggests that it may have been *Agave vivipara* but by this he did not mean perhaps *Agave Wightii* (J) of this Bulletin
99	Oviedo quoted by *Martius* (Beitrag, p 10) says that on the mainland in the country of *Araya* there is a nation on whose lands the Maguey is so abundant that they are called 'Magueyes' The allusion is perhaps to the Maya plantations From a recent work on Costa Rica reviewed in *Nature* No 1846, dated 16th March 1905, it appears that parts of the Isthmus were held in the 16th century by a civilized race called *Mangue*
103	The first mention of Maguey is by this author who says the ancient inhabitants of Haiti had a sort of drum or cymbal which was called Maguey Martius thinks that these drums may have been made from the scape of an *Agavea*
125	Squier rightly distinguished the Pulque Agave from the so called '*A americana*,' but *Agave mexicana* of Lamarck is a misnomer, and the *Agave mexicana* of Moore (in Gardener's Chronicle) is more probably Agave (F) as to which see '*Tequila*' Bates (in Stanford's Compendium) also calls the Maguey *A americana* and supposes that there is only one species throughout the 'Tierra Templada' from Zapotlan eastwards
85, 147	*A Salmiana* Otto is commonly identified with *A atrovirens* Karwinski, which is said to be one of the chief Pulque Agaves in the State of Mexico A large *Agave* is met with in gardens on the Continent of Europe under the name of *A Salmiana*. Our Agave (C) appears to be near this species
129	Meaning 'Wild Maguey' Travellers have frequently reported finding '*Agave americana*' wild but truly wild examples of Linnæus' *A americana*, of the Pulque Agaves, and of *A. sisalana*, if they exist, remain to be discovered.
95, 96	See *Tequila*.
160 (footnote)	See *Maguey mansofino* Beni says the scientific name is 'Agave Massimilianaea.'
95, 93	Meaning 'fine cultivated Maguey,' to distinguish a plantation kind from spontaneous hedge *Agaves* It is unlikely that the term is restricted to the one species A Mexican writer professes to have distinguished over 16 sorts in the Apam tract alone which is the principal Pulque making area. He must have taken count of very fine distinctions, but even so the statement is significant.
	An Indian tribe of Central America in the 16th century 'named from the Agave' See *Maguey* (2), but cf the next also.

Name	Authority	Language	Where used	Scientific determination
Magueyes (2)	Zarate (in Martius)	Spanish	Central America (Mexico)	..
Magui	M Blanco (Flora de Filipinas) *v* Agave	*Filipino*	Philippines	*Agave americana*
Maguey	Hakluyt, etc	Spanish	Central America (Mexico)	Agave spp.
Malai Kathalai	Govt Botanist Madras	Tamil	S India (S Arcot)	Agave Vera Cruz Mill
Malai Kattalai	Ditto	Do	S India (Tanjore)	Ditto
Malay Kuttalay Nar	Ainslie	Do.	S. India	*Agave vivipara*, Linn
Malino	Coulter	Spanish?	Hawaii	*Furcraea* spp
Manchi Kala Bunda	Govt Botanist Madras	Telegu	S. India (Cuddapah)	Agave Vera Cruz Mill
Manguai	Ditto	Spanish	America	Agave spp
Manguei	Loosebotten (in K. Bauhin)	Do.	Do.	Ditto
Manguerie	Pedro Ordonnez (in Sloane)	Spanish	America	*Aloe secunda ?*
Manila	Kew Sel Papers (Addl Ser II), LXVI	English	Turks Islands	*Furcraea cubensis*
Manila Aloe Fibre	Kew Sel Papers (Addl Ser II), LXII	Do.	Philippines	*Agave vivipara* L
Manjib	Mad Fab Cat 1857	Deccan	India (Hyderabad)	*Agave* sp
Manjiva Naru	Cameron (Bangalore Cat.)	Canarese	S India (Mysore)	*Sansevieria Zeylanica*, Roscoe

Page	Remarks
...	Maguey farms or plantations were so called by the early Spanish invaders of Mexico.
96	Mr. Edwards notes that this form of the name survives locally. The common naturalized Agave in the Philippines proves to be *A. Cantala*, Roxb.
109, 110	Cf. *Magueis* and *Magueyes* (2).
86, 147	=Agave (D.). Meaning of 'Malai' not known
86, 147	Ditto ditto.
95, 96	Perhaps Agave (J).
94, 95	Brought from America presumably.
86, 147	Agave (D). Cf. *Manjina Nar*, *Motta Munjee Nar*, etc.
99	A variant of *Maguey*.
99	Ditto.
116	As Sloane states that *Cabuja* was another name, the plant was doubtless a *Furcraea*.
..	See also Silk grass (4).
183	The naturalized Philippine species proves to be *A. Cantala*, Roxb.
...	Cf. the next and *Munjee Nar*.
77	(Misprint in the botanical name altered.) Cf. *Motta Munjee Nar* and *Manchi Kalabanda*.

NAME	Authority	Language	Where used	Scientific determination
MAGUEY	Booth (in Kew Sci Papers Addl Ser II=LXIV)	Spanish	Central America	Agave spp
MAROOL	Mad Exh Cat. 1857	Telegu (and Tamil)	S India	*Sanseviera Zeylanica*
MARUL (1)	Watt E D	Hindustani	India	*Sanseviera Zeylanica*, Willd
MARUL (2)	[illegible] Bot at Madras	Tamil?	S India (Tanjore)	Agave Vera Cruz, Mill.
MAST	M ss Gard Report 8 G et	English	N America	Agavene spp
MAURITIUS HEMP	Kew Sci Papers (Addl Ser II) LXV LXVI	English	Cosmopolitan	Furcraea spp
MAURVI	Asiatic Researches IV, 271	Sanscrit	India	*Aletris*, Linn

Page	Remarks
	A variant of *Maguey* If this represents the actual sound, the original is possibly 'Ma qui,' and the second syllable = *Qui* — *Quil* (q v)
77	'Kattalay Nar' from Travancore at the same exhibition was apparently *Sanseviera* in which case the same *local* name would cover *Aloe*, *Agave*, and *Sanseviera*, but perhaps there has been a mistake in ticketing
77	This (Marul) is the correct transliteration
87, 147	Cf. the preceding and *Marool* also
80 82	Applied in the U S A to the scape or 'po'e' of *Euagave* and *Furcraea*
94-95	It is usual to ascribe this commercial fibre to *Furcraea gigantea* Vent, but the plants grown in S India do not always, or even ordinarily, answer to that species as defined by Mr Baker From the authority quoted by us it is clear that several species of *Agave* and *Furcraea* to say nothing of *Sanseviera* have run wild in the Mauritius while the "Mauritius Hemp" that comes from St Helena is not perhaps from a *Furcraea* at all, but from the St Helena *Agave*, (*A angustifolia* of the Buitenzorg Garden) which may be Agave (E) i e, *Roxburgh's Agave* = *A. Cantala* of this Bulletin Wight s S Indian *Furcraea* (see Part I, p 19) and *Cajun* above also the '*Agave virdis*' of Madras Exhibit on Catalogues are perhaps *Furcraea cabensis* Ait. which is said to be the best fibre *Agavea* of the West India Islands. Different *Furcraeas* thrive throughout the moister parts of India, and the fibre is being brought into use in N India also. Certain of the species tend like *Agave* (G) (*Sisal*) and the Honduras Silk Grass plant [see *Istle* (1) and (2) and *Silk Grass*] to lose the side-thorns (prickles) of the leaf in cultivation The true *Agave foetida* of Linnaeus grows in the Sibpur Garden, but we doubt its identity with the *Mauritius Hemp* plant of S India. It seems to be common along the coasts of the Isthmus and the Orinoco region where it yields 'Cobblers thread'—See *Aloes Vert*, *Cabuya* *Hayti Hemp* *Pite d'Haiti* *Pvet* *Pita de Zapateros*, &c
77	The *Sanseviera* fibre or Bowstring Hemp of Roxburgh (to be distinguished from the *Marsdenia* or *Jiti* bast, said to be the 'Muruva Dul' of Ceylon) The name of the plant as distinguished from the fibre was 'Murva' which survives in the Bengali *Murva* or '*Moorba*' (Bengal Plants, p. 1054) Species of *Sanseviera* were at first referred to the genus *Aletris*

Name	Authority	Language	Where used	Scientific determination
MAYA	Sagra	Cuban	Cuba	*Agaveae spp.*
MAYPOLE	Hughes' Hist. Barbadoes (in Martins)	English	Antilles (Barbadoes)	*Furcraea cubensis*, Haw.
MELLIS KYRE	Ainslie	Portuguese ?	India (Deccan)	*Agave vivipara*, Linn.
MESCAL	Miss Gard. Report 1896	Spanish	Central America (Mexico)	*Agave spp.*
METL	Hernandez (and others)	Aztec	Central America	*Agaveae spp*, also *Bromeliaceae.*
METL COTLI	Hernandez	Do.	Central America (Mexico)	Agave sp.

Page	Remarks
128	Squier does not say which of the 'varieties' of *Henequen* or *Pita* is so called in Cuba if it be a *Furcraea* then the reference is perhaps to the mainland types to where the Maya Indians had their *Henequen* plantations Great weight attaches to the view that '*Furcraea cubensis*' was taken to the Brazils from the Antilles, but more recent evidence points to the home of the *Furcraeas* being rather in Guiana and the neighbourhood In Venezuela the 'Maya' *fruit* is said to be a Bromelia (*Bromelia chrysantha*)
94 95	Probably one of the fibre yielding *Furcraeas* Peter Martyr's text suggests that the Caribs worshipped one or other of the *Agaveae* and a *Euagave* was deified in Mexico *Cf Maft* and *Pole* also
110	Ainslie gives this also as *Mellis Coar* and says it is a smaller sort of cordage or twine than 'Kyre' but from the same plant The 'Kyre' or 'Coar' is probably the 'Quecura' (Keura) of Garcia and other early writers which seems to have been applied both to *Pandanus* and *Agave* 'Mellore' was a Portuguese name for certain species of *Pandanus* including *P Leram*, Jones, but the 'Mellis' in Ainslie may refer to the flowers of an *Agave* The Maguey was called 'Honey Tree' and 'Melt' a false analogy being drawn between 'Metl' and words meaning Honey in the Romance languages of Europe, the flowers, of the Island species particularly distil honey (Cf however *Agua de Miel*)
98	A spirit made from certain of the *Euagaves* that grow in the State of Mexico It is called 'Mexical' or Mescal apparently to distinguish it from '*Tequila*' and '*Mescal de Maguey*' as against *Aguardiente* and *Sotol* (which see, also *Aguardiente* and '*Tequila*')
110	A general name for sundry plants of Mexico (in the wider sense) mostly of the genus *Agave*—usually employed by the Mexicans themselves with a qualifying term to denote the sort intended When the Spaniards arrived from the Islands they applied to the [illegible] *las Maravillas*' is a [illegible] imaginary plant gifted with the qualities of several different species
100	See *Cotl* *Metl*.

Name	Authority	Language	Where used	[illegible]
Mexican Grass	Gulley Hoyle	English	Australia	*Agave ixtli, Lecheguilla* (and allied species)
Mexican Hemp	Do	Do	Ditto	Ditto
Mexican Whisk	Kew Bul Papers (Add Ser II) LXXIX and LXXX	Do	Europe and America	*Epicampes macroura* Bth
Mexocotl	Hernandez	Aztec	Central America (Mexico)	Bromeliaceæ *Spp*
Mezcal (1)	Dudley	Mexican	Ditto	*Agave potatorum* Zuccarini
Mezcal (2)	Jackson	Do	Ditto	*Agave americana*
Mohdha	[illegible] of Ind	Bengali?	Central India (Singhbhum)	Agave Vera Cruz, Mill
Motta Munjee Nar	Mad Exh Cat 1855	Telugu?	S India (Madura)	*Agave Sp*
Munda	Govt Botanist Madras	Malayalam	S India (Malabar)	Agave Wightii (of this Bulletin)
Munjee Nar	Mad Exh Cat 1857	Canarese?	S India (Salem)	*Agave Sp*
Muraga	Asiatic Researches IV 271	Hindi	India	*Aletris* Linn

Page	Remarks
89, 147	Dr Guilfoyle says that this name is given to the *Sisal Hemp* fibre (from species allied to *Agave sisalana* Perrine) It is also mentioned by Dodge in his valuable '*Useful fibre Plants of the World.*'
89, 147	This is no doubt the 'Sisal' introduced into Australia, which we believe to be Agave (G) of this Bulletin See *Sisal Hemp* also
•	This has been confused in India with *Mexican fibre* (1) (which see) and with the fibre locally obtained for brush making purposes from species of *Euagave* naturalized in India The American product is used as a substitute for fibre obtained in Europe from different *Gramineae* (true grasses) some of which are believed to be abundant in the Himalaya also In America brooms are made also from an *Aristida* closely allied to species that abound in India *e g*, the 'broom sticks' of the Madras Presidency
108	Probably *Bromelia* Pinguin Linn Given with the different kinds of *Metl*, but *not* as a fibre plant
	Mr Rose observes that the *Pulque* and *Mescal* Agaves are of different species in different parts of Mexico We do not know whether *Agave* (D) is one of them and cannot therefore say whether any have been naturalized in India See also *Mescal*
96	A version of *Mescal* See also *Mescal Metl* and the preceding.
86 147	Agave (D) Perhaps from the Bengali *Murga* which see.
95, 96	Cf *Manchi Kalabunda, Manjee, Munjee Nar*, &c
91, 147	—Agave (J) Cf *Kalamanda* In the *Pharmacographia Indica* it is noted that the true aloe is called *Mandala* because of the scimetar like leaves
96	Cf *Manjee Motta Munjee Nar*, &c Doubtfully the same as the 'Fibre of Mungie Plant' shown from Mysore in 1855
77	Usually now spelt d 'Murga' There are many variations such as Murva Murgab, Murgahree Moorgal e, Murva, Murba, Moorba, etc., but all usually refer to the Bowstring Hemp of Roxburgh—a species of *Sanseviera* (In Ceylon however 'Muruva-dul' is said to be the last of *Marsdenia tenacissima* W & A) As a name of *Sanseviera* this has found its way to the West Indian Islands See *Moorva* and the next also

Name	Authority	Language	Where used	Scientific determination
Murga (1)	Watt E. D	Bengali	Bengal	*Agave americana*
Murga (2)	R. E. P. Government of India	Bengali	Central India (Singhbum)	Agave Vera Cruz, Mill.
Musambra	Pharmacographia Indica (III, 472)	Canarese	S. India	*Aloe* sp. [?]
Mutta Saga	Govt Botanist Madras	Telegu?	S. India (Ganjam)	Agave Vera Cruz, Mill.
Mysore Aloes	Pharmacographia Indica (III, 472)	English	S. India	*Aloe* sp.
Nanas Boaya	Rumpf	Malay	Amboyna (Malay Archipelago)	Agave Cantala, Roxb.
Nanas utan	Do.	Do.	Java, &c.	*Agave* sp.
Nannas Sabrang	Hasskarl (in 'Flora' II, 1842 p. 5).	Do.	Java (Sunda, &c.)	*Agave Rumphii, Hasskarl.*
Nar	Ainslie	Tamil?	S. India	*Agave, &c.*
Nequametl (1)	Piso	...	S. America	Furcræa tuberosa, Ait.

Page	Remarks
95, 96	It is not quite clear whether the older authorities regarded '*Muraga*' or '*Murga*' as derived from *Murva* The ordinary word for a gamecock is commonly derived through the Persian from the Arabic, but the wild bird is Indo Malayan, and 'Murva' is given by some authors as a variant of 'Murgha,' so the word may be originally Indian In N India *Sansevieria* is as much an incomer as *Agave* (see Bengal Plants, 1054), and when *Murga* is applied in N India to *Agave* the allusion is plainly to the 'terrible spurs' as an American writer calls the spines of certain species The habit of the leaves in *Sansevieria* may have earlier suggested a fanciful resemblance to the spur of a '*Bantam*'
86, 147	See the last and *Mordha*
113	From the Arabic name of the true Aloe (see *Sabr*, etc) and common term for the *drug* throughout India, but in S India locally applied also to a 'size' or 'glue' used in house decoration, much as gilder's size is used in Europe, it seems possible that this is obtained from an *Agave* See *Mysore Aloes* also.
86, 147	Cf *Motta Munjee Nar*, *Sagi Mutta*, etc
...	[illegible]
100	Meaning 'Alligator Pineapple'
102, 114	Meaning 'Wild Pineapple' From Rumpf's account it would seem that more than one Agave had reached the Indian seas by the middle of the 17th Century, for the merits of the fibre were even then disputed See also the next and the preceding
134	Meaning 'Foreign pineapple' *Hasskarl* himself later identified this with our Agave (F)=*A Cantala* Roxb (see his *Neuer Schlressel* etc., 1866) and with the 'Nanas Costa' of Java mentioned by Miquel.
95	In several languages of S India signifies 'cord,' 'thread' or 'fibre' In Hindustani it is a 'ligament' or 'sinew.'
94, 95, 129	This is not Hernandez' *Nequametl* unless the figures have been misplaced by his editor: that looks like an *Agave* of the *Littaea* section, or, as Martius suggests, a *Dasylirion*.

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Murga (2)	R F. P Government of India	Bengali	Central India (Singhbum)	Agave Vera Cruz, Mill
Musambra	Pharmacographia Indica (III 472)	Canarese	S India	*Aloe* sp [?]
Mutta Saga	Govt Bota. at Madras	Telegu?	S India (Ganjam)	Agave Vera Cruz, Mill
Mysore Aloes	Pharmacographia Indica (III, 472)	English	S India	*Aloe* sp
Nanas Boaya	Rumpf	Malay	Amboyna (Malay Archipelago)	Agave Cantala, Roxb
Nanas utan	Do	Do	Java, &c	*Agave* sp.
Nannas Sabrang	Hasskarl (in 'Flora' II, 1842 p 5)	Do	Java (Sunda, &c)	*Agave Rumphii, Hasskarl*
Nar	Ainslie	Tamil?	S India	*Agave, &c*
Nequametl (1)	Piso	...	S America	Furcræa tuberosa, Ait

Page	Remarks
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184	Meaning 'Foreign pineapple' *Hasskarl* himself later identified this with our Agave (F)=*A Cantala* Roxb (see his *Neuer Schluessel* etc., 1866) and with the 'Nanas Costa' of Java mentioned by Miquel
95	In several languages of S India signifies 'cord,' 'thread,' or 'fibre' In Hindustani it is a 'ligament' or 'sinew.'
94, 95, 129	This is not Hernandez' *Nequametl* unless the figures have been misplaced by his editor: that looks like an *Agave* of the *Littaea* section, or, as Martius suggests, a *Dasylirion*.

Name	Authority	Language	Where used	Scientific determination
Nequametl (2)	DeLaet		Antilles (Tobago)	*Furcraea cubensis* (? Martius)
Nipi	Blanco (Fl de Fil p)	Fil pino	Philippines	*Agave americana*
Nita	Balfour (Cyclo paed a)	Tamil	S Ind a	*Agave americana etc*
Nulkyitha	Govt Botanist Madras	Malayalam?	S India (Mala bar D st)	Agave Wightii (of this Bulletin)
Octli	Herna idez	Aztec	Central America (Mex co)	Agave Spp
Ocpatli	Gomara (in Martius et)	Do ?	D tto	
Offset		Engl sh		
Palkande	Dymock (Marathi Names p 5)	Marathi	S W In l a	*Agave* Sp.
Palma	Booth in Kew Sel Papers (Add l Ser II) LXIV	Spanish	Central America (Mexico)	*Agave* and *Yucca* Spp
Panam Katrazhi	Watt F D	Malayalam	S India	*Agave americana*
Parkand	Ditto	Marathi	S W India	Ditto
Patha	.	Panjabi	N W India (Indus Valley)	Nannorhops Ritchieana Wendl
Pati	Hernandez		Central America (Mexico?)	Agave sisalana, Perrine ?

Page	Remarks
94 95	In editing Markgraf's work on the Brasils De Laet added *Nequametl* and a drawing of it as it grew in Tobago, this Jacquin has identified with his *Agave cubensis*, which is taken as = *Furcræa cubensis* of Ventenat
96	This name is not in Edwards Blanco says the outer leaves are smal e than in typical 'Americana' meaning possibly *A Cant* a Roxb
96	Fibre of different *Agaveae*
91, 147	Cf *Ana Kyitha.*
97	Hernandez does not mention Pulque ' but gives *Octli* as the Mexican name, in his day, of the fermented liquor
98	A herb which was mixed with the Agave mead to give it strength Hernandez gives two different names for it The practice continues, and it has been suggested but probably without due ground, that the thorn apple (*Datura Stramonium*, Linn) is employed
81	A lateral shoot from the trunk or stock In the Indian species of *Euagave* these are given off under ground but the seedling develops at the surface
95	Cf *Parkand* The 'Kand' is probably = 'Kanta,' a thorn See *Kenda* etc
98	The earliest mention of the *Agaveae* in the Islands compares the ... in Tula Zacatecas, and ... to d fferent kinds of *Agave* ... e Palma loca, Pal na real
96	Cf *Anaik Katra hai*, etc.
96	Cf *Palkande*
	See *Aloe* (2) *Pesh* and *Wild aloe*
117	This does not seem to be either Spanish or Mexican and no Aztec equivalent is given The sketch suggests a *Furcraea, or* Agave (?) (the spineless form) It is called 'Metl lenissimum,' and is said to produce thread of the finest quality

Name	Authority	Language	Where used	Scientific determination
Pedda Kala bandа Nara	Ainslie	Telegu	S India	*Agave vivipara*
Pedmai Katha lai	Govt Botanist Madras	Tamil	S India (Salem)	Agave Sp
Peetha Kala banda	Ditto	Telegu	Ditto	Agave Vera Cruz, Mill
Peetha Kala bantha (1)	*Drury* (Useful Plants of India)	Ditto	S India	*Agave vivipara*
Peetha Kala bantha (2)	Brown and Wood	Ditto	Ditto	*Agave americana*
Pei Kathalai	Govt Botanist Madras	Tamil	S India (Madras Tinnevelly)	Agave Vera Cruz, Mill
Pemm	Dodge	Maya Indian	Central America (Yucatan)	*Ceiba pentandra*
Pemmanaw	Smith's 'Virginia' (Sloane)	..	N America ?	*Aloe Yuccae foliis*
Penca	Blanco &c	Spanish	Mexico, Philippines, &c	Agave Sp
Pesh	Liotard	Beluchi	Beluchistan and Indus Valley border	Nannorhops Ritchieana, H. Wendl
Petha Kala bantha	Watt E D	Telegu	S India (Bellary)	*Agave americana*, Linn
Petre	Squier	Spanish	Central America (Guatemala) ?	*Yucca gloriosa*
Piante de cent anni	Danielli	Italian	Italy	*Agave americana*
Piet (1)	J Commelin (Ed Kiggelaar)	Dutch	Antilles	*Fourcroya foetida*
Piet (2)	Boerhaave	Do	Ditto (Curacao)	Furcraea, sp ?

Page	Remarks
91, 92	Probably Agave (J)
83 84	We have not been able to determine the species, but this may be=Agave (A), the Burma species (See *Ixtilli*).
86, 147	Cf. the following.
138	See *Pita* and *Kalabuntha*.
99	Probably Agave (D) is intended
86, 147	Agave (D).
...	*Ceiba* belongs to a very different class of fibres from the *Agaveae* viz, the bast of the *Tiliaceae, Sterculiaceae*, etc, but see the next
98	Possibly a *Yucca* or a *Manfreda*
	The outer leaves of *Euagave* as distinguished from the *Cogollo* or *Coraлon* Taken from the artichoke or thistle (cardon)
..	See *Aloe* (2), *Patha*, and *Wild aloe*
96	Cf. *Peetha kalabanda*
	Dodge questions the identification.
96	i e *Century Plant*
94, 95	'*Fourcroya foetida*' [illegible] botanists knew this [illegible] probably the origi[illegible] S Indian Catalogu[illegible]
94 95	Boerhaave says that the thread was used by shoemakers in Curacoa, and that the name was given to the plant from the fibre. Cf. also *Pita de zapateros*, and *Pit*

Name	Authority	Language.	Where used	Scientific determination
Pinon	Squier	Spanish	Cuba	Agave or Furcraea, sp.
Pinuella	Do.	Do.	Central America (Panama, &c.)	*Bromelia sylvestris*
Pit	Hermann	Dutch	Antilles	Furcraea ?
Pita (1)	Ditto	Spanish or Carib	Ditto	Ditto
Pita (2)	Martius	Carib	Ditto	Agave and Furcraea, spp.
Pita (3)	Ditto	Portuguese	Portugal	*Agave americana*
Pita (4)	Dodge	Spanish	America	Agaveae, Bromeliaceae, and Palmae, spp
Pita (5)	Squier	Do	Central America (Panama, &c.)	*Bromelia sylvestris*
Pita (6)	Kew Sel. Papers (Addl. Ser II) XLVI	English	Turks Islands	*Agave rigida* var. *sisalana*
Pita Bromelia	Ditto	Do	Central America (Honduras)	*Ditto*
Pita de Zapateros	Seemann, Botany, Voyage of the Herald, p. 215	Spanish	Central America (Panama)	*Bromelia karatas*, Linn.

Page	Remarks
98	No doubt from 'Pina,' meaning 'wild pineapple'
93, 98	'Pina' is the 'Pine apple,' Pinuella = *Karatas Plumieri*, Morr probably See *Pita* (3)
94, 95	
94, 95	
97	Martius thinks *Pita* is the Carib equivalent of the Haitian *Henequen*, but leaves it in doubt to what species it was applicable The Cabuja of the Spaniards was he considers a *Furcraea* and the Island ... *'alms'* of Peter ... place he says ... acco in the W. ... id very widely, ... ndia
99	See also *Pitera*
..	A general term on the Caribbean coasts and Islands for the longer staples obtained from *Agaveae* and *Bromeliaceae* In S America it is replaced by *Caraguata* and *Ibera* with their variations *Pita* is often used with a specific addition, *e g*, *Pita de corojo* (a Palm fibre) *Pita pinuella* (see the next), etc In India it is restricted to *Agave*
93 98	In Panama and on the adjoining coast *Pita* is or was equivalent to *Istle* (1), or *Pinuella*, which is usually, we think, *Karatas Plumieri*, Morren Cf *Bromelia Pita*, *Istle* (1) and (2), *Pita Bromelia*, *Pinuella*, *Silk Grass* &c
...	*Agave sisalana*, Perrine—i e (G)
93 98	This fibre was highly reported on as a fine fibre by London firms many years ago It is said to be produced from *Karatas Plumieri* Morren (= *Nidularium Karatas*, Lem) which we identify with a plant that thrives in the Sibpur garden See *Istle* (1), *Bromelia pita*, and *Silk Grass*.
98 98	Meaning '*Shoemakers thread*' The leaves of this plant (says Seemann) furnish a strong fibre He adds that the thread is extensively used by shoemakers. This is said of other 'Pita' fibres also by various authorities *Bromelia Karatas* Linn. is = *Karatas Plumieri*, Morren

Name	Authority	Language	Where used	Scientific determination
PITA FIBRE	Cameron (Bangalore Cat)	English	S India (Mysore)	*Agave mexicana*
PITA FLAX	Cleghorn (Forests and Gardens of S India)	Do	S India	Ditto
PITA FLOTA	Dodge	Spanish	Central America (Costa Rica)	*Furcraea gigantea*
PITA HEMP	Do	Do	America	Yucca and Furcraea spp
PITA KALA BANTHA	Balfour (Cyclopædia)	Tamil	S India	Agave, sp
PITE (1)	Du Tertre (in Sloane)	French	Antilles	*Agave* or *Furcraea sp*
PITE (2)	Do	Do	Do	Tillandsia sp
PITE D'HAITI	Fasio (in Journ d' Agric Trop 1904, No. 41 p 343)	French	France, Algeria &c	Furcraea sp
PITEIRA	Martius	Portuguese	Portugal and Brazil	*Agave americana*
PITHA KALA BANDA	Balfour (Cyclopædia)	Tamil	S India	*Agave vivipara* Linn
PITHA KALA-BUNTHA	Watt E D	Do.	Do	*Agave americana*, Linn.
PITTA	Humboldt &c	Spanish	America and West Indian Islands	Ditto

Page	Remarks
125	Mr Cameron correctly separates the fibre Agave from the true *americana*, but as to the specific name see *Maguey* (4), *Mexican Aloe* (1), *Tequila*
96	Fibre produced from Agave (D) or (J) or perhaps from a Furcraea.
94 95	*F* [illegible] Mr Hemsley has remarked [illegible] *Agave* [illegible]
98	We should think this covered *Agave* and certain *Bromeliaceae* also
98	Cf *Peetha Kalabunda*
117	Du Tertre speaks of two spineless sorts of *Pite*, of which Sloane thought one might be his *Aloe Yuccae foliis* (*Henequen* of the Islands) but see *Piet* also
...	An epiphyte belonging to the pineapple family Cf. *Caraguata* IV.
109	See *Hayti Hemp*
85	The garden plant seen in Brazil by *Martius* was probably one or other of the varieties of *A americana* Linn i e our (B). He says that he never saw *A americana* naturalized in S America.
91, 147	Perhaps Agave (J) but there is great confusion in the vernacular names recorded in most books from S India.
86, 147	No doubt Agave (D), at least usually See *Peetha Kalabanda*.
108	See *Pita* (4) above

Name	Authority	Language	Where used	Scientific determination
Pitta Anetz	Sloane	Malagasey	Madagascar	*Aloe Yuccae folius*
Pitte	Lamarck Dict, I 53	French	France and French colonies	*Agave foetida Linn*
Pole	...	English	Cosmopolitan	Agaveae
Pole plant	Miss. Gdn. Report, 1896	Ditto	America	Ditto
Pooty Mungem	Mad Exh Cat. 1857	Canarese	S India (*Mysore*)	*Aloe* sp.
Pulque	Humboldt (and others)	Spanish	Central America (*Mexico*)	*Agave*, spp.
Pulque Agave	Squier, Bates, and others	English	Ditto	*Agave mexicana*

Page	Remarks
98 113	We have not traced Sloane's authority (possibly an edition of De Flacourt's work) but the plant was perhaps a *Sansevieria* or the
...	See *Anana de Pite, Bowstring Hemp* (3) and *Laffa* Identified by Lamarck with a *Furcraea* grown in the *Mauritius*
80	The scape or flowering stem of *Euagave* and *Furcraea* When this is thrown up from the trunk the plant is said to 'pole' Cf *Hampe, Mast,* and *Maypole*
81	*Bulbil,* which see
96	Th s is given as the source of ropes which were carefully tested at the Arsenals and exhib ted in 1857 at Madras 'Pooty Munjee' is referred to '*Hibiscus cannabina*' See also *Cuthala Nar*
	obscure and the statement that *Pulcu* is an Araucanian word for a drink of Peru wants confirmation 'Pulcro' is a Spanish word, and *Pulco* or *Pulque* may be derived from it *Pulqueria* is a shop or booth for the sale of *Pulque* also called *Cantina*
98, 140, &c	The true *Ag* all intents known at Whether *A* *cana* and *A mexicana* of S Europe) is one of the Pulque yielding species or not remains doubtful Recent American authorities ment on *A atrovirens* of Karwinski (which is commonly identified with *A Salmiana* Otto) as the chief source in the Apam plain and other centres of the *Pulque* cultivation This appears to be near our *Agave* (C) sometimes called but wrongly '*A Jacquiniana*' '*Agave mexicana*' is a name to which there is practical objection *Ignatio Blasquez* (quoted by Dodge) states that there are 33 varieties of *maguey* which grow or are cultivated in the Apam district and 10 Pulque Magueys in Cholula The brothers Blasquez held that the best species of Pulque Maguey was undescribed, and named it '*A Maximileanea*' but their distinctions were too fine for either scientific or industrial purposes apparently

NAME	Authority	Language	Where used	Scientific determination
QUETZALYCHILI	Hernandez	Aztec	Central America (Western Mexico)	Agave Wightii (of this Bulletin)
QUI	Martius	Maya Indian	Central America (Yucatan, &c)	Agaveae spp.
RAIL KATTALAI	Govt. Botanist Madras	Tamil	S India (Tanjore)	Agave Vera Cruz, Mill.
RAILWAY ALOE	Do.	English	S India	Ditto
RAIZ DE ZACATON	Kew Sel Papers Addl. (Ser. II) LXXIX	Spanish	Central America (Mexico)	*Epicampes Macroura*, Bth.
RAKAS	Balfour (Cyclopædia I, 51)	Hindustani	S. India	*Agave americana*
RAKASHI MATTALU.	Mukerji (Desc. Cat Ind Prod Amsterdam, etc)	Telegu	Do	*Agave americana*
RAKASI MATTA	Govt Bot. Madras	Telegu?	S. India (Ganjam)	Agave Vera Cruz, Mill.

Page	Remarks
91, 102 147	The drawing and description of this 'Metl' answer well to our Agave (J), by any rece country abou warm places it 'Metl Pitae' (i e 'Thread Agave') and that the fibre was prized specially for cloth weaving It is plainly a Euagave, and though the stock of Theometel is like that of A Wightii in the sketch, the leaf of this other is much nearer (J)—or the Tequila
145	'Qui' or 'Quil' seems to mean herb' or 'grass' in several languages of Central America, and in Yucatan was appl ed to the fibre yielded by various Agaves Furcraeas and Bromeliaceae The Maya Qa che country extends from near Vera Cruz to San Salvador taking in both coasts from Guatemala to Honduras but towards Mexico ?lumiers, ars that Central Mangue dynasty) Maguey (2) and Magueyes (1)
86, 147	Railway Aloe' See the next
86, 147	In Madras the 'Railway Aloe' is commonly Agave (D) In Northern India the same species has been used in parts for railway fencing, but in the drier tracts Agave (F) has been substituted Agave E is used also
..	Often called (see Dodge) simply 'Raiz,' i e roots Cf Aloe fibre, Broom root, Brush fibre, Mexican fibre Mexican Whisk and Rejn Raiz is said to be corrupted into 'rice root'
	From the Sanscrit Rakshasha = an evil demon Names of Agave species are frequently compounded with this (See Bramarakashie, etc) Spelled in old reports etc as 'Rakus'
96	See also Rakshi Matalu under Agave americana in Watt F D., and the following
86, 147	Ditto ditto

NAME	Authority	Language	Where used	Scientific determination
RAKASI MATTALU	Govt Bota nist Mad ras	Telegu	S India (Nellore)	Agave Vera Cruz, Mill
RAKAS PATTA	Watt, E D	Hindustani	India (Deccan)	*Agave americana*
RAKSHASHA DALI	Govt Bota nist Mad ras	Telegu	S India (Cud la pah)	Agave Vera Cruz, Mill
RAM BANS	R F P., Govt of India	Hindi	Rajputana ? (Jai pore)	Agave Cantala, Roxb
RAMBANSKEORA	Supdt Govt Gardens U P Agra and Oudh	Do	N W. India (Saharanpore, etc)	Ditto
RAMKANTA	Watt E D	Do	India	*Agave americana* Linn
RASPADOR	Coulter	Spanish	America West Indies and Pacific Islands	...
RAVANA	Ainslie	Canarese	India	*Aloe perfoliata*, Linn
RAVANA MESHID	Buchanan (afterwards Hamilton)	'Karnataka' (i e Canarese)	S India (Mysore)	*Agave vivipara*
REDA AONAS	Liotard	Guzarati	Western India	*Agave* Sp
REJU	Imp Inko Hand bst (Ind Sec) No 12	Bengali	India (Calcutta)	*Epicampes macroura* Bth ?

Page	Remarks
86, 147	See also 'Rakashmatalu' under *Agave americana* in Watt E. D. and the following
96	Possibly our Agave (D) 'patta'=leaf in Hindustani;—also spelled Rakis pattah
86, 147	Cf. the preceding
87, 147	'Divine (*i e*, wild) bamboo.'
87, 90	See the preceding and *Banskeora*, applied to (F) as contrasted with (J)
96	Cf *Rambans* ('Kanta'='thorn' or 'prickly shrub,' etc)
..	[illegible]
118	Ainslie states that (with the scape presumably) this attains 10—12 feet in S India
91, 181, 147	Agave (J)='*A vivipara*' of Wight, *not* of Linnæus Ainslie says that Ravana Meshid is Canarese for a true *Aloe*, which produces the drug in India
	Evidently a survival from the days of Portuguese ascendancy *Rede*=net and *aonas*=pineapple Cf. *Crarata de rede* Agave fibre used by fisher folk on the Indian coasts and islands for nets, etc.
	Imported formerly from Mexico for brush making The present supply of 'whisk' seems to come from the N W Terai (Mozaffarnagar etc) and to consist of the roots of one or more *Andropogons* Cf *Raiz de Zacaton*

Name	Authority	Language	Where used	Scientific determination
SABBARE	Forskohl Fl Aeg. Arab	Arabic	Arabia Felix (Yemen)	*Aloe maculata*
SABR	Do	Do	Asia Africa, etc	*Aloe officinalis*
SACCI	Engelmann	Maya Indian	Central America (Yucatan)	*Agave rigida* var, *longifolia*
SACQUI	Martius	Ditto	Ditto	*Agave* sp
SAGANARA	Madras, Exh Cat, 1855	Telegu	S India (Masulipatam)	Sansevieria ?
SAGANARA MATHA	Govt Botanist Madras	Ditto	S India (Kistna)	Agave Vera Cruz, Mill
SAGI MATTA	Balfour (Cyclopædia)	Telegu	S India	*Agave americana*
SAMATO	Balfour (Cyclopædia)	Telegu	S India	*Fourcroya cantula*
SAMBA KATTALAI	Govt Botanist Madras	Tamil	S India (Salem)	Agave sp.
SAN KA NAR	Watt, E D	Deccani	S India (Deccan)	*Agave americana*
SAUGA ROPE	Madras Exh Cat. 1857	Telegu	S India (Guntoor)	*Sanseviera Zeylanica*
SAUGOO NARA	Do	Do	S India (Vizianagram)	Ditto
SAPARRA	Martius	Sicilian	Sicily	Ditto
SEASIDE ALOE	Ainslie Mat Med (1826) ii 169	English	S India	*Aloe littoralis*, Koenig

Page	Remarks
107	Forskohl distinguishes this from 'Aloe officinalis' to which he attributed the 'Socotra Aloes' Cf *Sabr*
113	Lane and Burton quote certain meanings of the Arabic word which refer to 'patience' or 'endurance' but these are most likely secondary, and founded on the plant's remarkable vitality (cf *Sempreviva)* There are many variations, *e g*, Sabir, Sibir (Persia), Cebar and Sebar (Spain), Sobr (Palestine), Sabila and Zabila See also *Acebar Azeure, Azul* etc Sabarra and Seubbara (Africa) are perhaps of independent origin, and have given rise to a number of the names of the naturalized *Agave* of S Europe (see *Sabbare, Seubbara Saparra* etc)
143, 144	[illegible]
77	Sent as '*Bowstring Hemp* Martius seems to have thought that th s might be *Marsdenia tenacissima* W and A (See *Bowstring creeper*).
86, 147	Cf the next.
96	Cf the preceding Spelled by Brown (Handbook of Agri-Hort. Soc Gdn and neighbourhood of Madras, 1866) as Sagi Mutta Perhaps from 'Sagi' (Malay) = *Metroxylon* sp (a palm)
130	*Fourcroya Cantula* of Haworth is a misnomer, apparently, for *Agave Cantala*, Roxb.
147	This is very nearly allied to Agave (J) but seems a lighter and [illegible] The variegated [illegible] ave (J) may be [illegible] n Tinevelly, etc
96	'San' is primarily *Crotalaria* or *Hibiscus* fibre Cf. *San ka nar* and *Belati pat*
77	[illegible]
77	
107	From '*Sabarre*' or '*Seubbara*' which is applied to *Agave* spp, naturalized in N Africa (probably to *Aloe* originally)
113	Cf *Small Aloe.*

Name	Authority	Language	When used	Scientific determination
Seema Katha-lai	Govt Botanist Madras	Tamil	S India (S Arcot)	Agave Wightii (of this Bulletin)
Seema Katta-lai	Do	Do	S India (Tanjore)	Ditto
Seemai Kattalai	Do	Do	S India (Tinnevelly)	Agave sp
Seemay Cattalay	Mad Exh Cat 1857	Tamil	S India (Chingleput)	*Fourcroya gigantea*
Seemay Kathalay	Brown and Wood	Tamil?	S India	*Furcraea gigantea*, Vent.
Seemay Kuttalay	Madras Exh Cat 1855	Tamil	S India (Madura)	Furcraea sp.
Seeppu Kattalai	Govt Botanist Madras	Tamil	S India (Tanjore)	Agave Vera Cruz Mill.
Sempreviva	Danielli	Italian	Italy	*Agave americana* Linn
Seubbara	Balfour (and others)	Arabic	N. Africa	*Agave americana*
Short aloes	Mad Exh Cat. 1855	English	S. India (Mysore)	*Agave americana*
Silk Grass (1)	Spon	English	England and America	*Nidularium Karatas*

Page	Remarks
91, 147	Cf *Samba Kattalai* and the following.
91, 147	Ditto ditto
87	See *Samba Kattalai.*
94, 95	Also spelled 'Cuttalay' Cf. *Seemai Kattalai*
94, 95	Cf the preceding
94, 95	'The small Aloe', and should therefore be a true *Aloe*, but see the preceding
...	Cf also the preceding
114	The true *Aloe*,—and hence the *Agave*,—was called 'Sempervivum' and 'Aizoon' in Mediaeval Europe with reference to their tenacity of life, but the connected traditions (see *Sabr*) are of Syrian (or Nubian) origin
96	See *Sabbare*, *Sabr*, and *Saparra*
118	The scientific names of this and *Long Aloe* seem to have been transposed (See *Long Aloe*)
93 96	Spon's reference is correct for the coast from the Gulf of Campeachy ... *guata* (1) *Caraguata* V, *Caroata*, *Cerratow*, *Gravata Gravatha*, *Henequen* (1), *Istle* (1) and (2), *Ixtle* (1) and (2), *Ixtli* (1) *Karaota*, *Mexican Fibre* (3), *Pinuella*, *Pita* (3), *Pita Bromelia*, and *Pita de Zapateros*, also the following

NAME	Authority	Language	Where used	Scientific determination
SILK GRASS (2)	Temple (in Journal Soc. of Arts, V. 125)	English	Central America (British Honduras)	*Bromelia sylvestris*
SILK GRASS (3)	Dodge	Ditto	England and America	*Bromeliaceae and Agaveae*
SILK GRASS (4)	Kew Sel. Papers (Addl. Ser II) LXV	Ditto	Jamaica	*Furcraea cubensis, Haw*
SILK OF GRASS	Hariot (in Sloane)	Ditto	Central America	*Aloe Yuccae folius*
SIMAI KATHALAI	Mukerji	Tamil ?	S India	*Furcraea gigantea*
SIME KATTALAY	Balfour (Cyclopædia)	Telegu	Ditto	*Fourcroya Cantula Haw.* [formerly *Agave Cantula* Roxb]
SIME KATTALE	Liotard	Canarese	S India (Mysore)	*Agave vivipara*
SIROOGHOO KUTTALAY	Ainslie, Mat, Med 1826, ii—169	Tamil	S India	*Aloe littoralis,* Koenig
SISAL	..		...	...

Page	Remarks
98	From Temple's description this name, given by the denizens of British Honduras to the *'Istle'* or *'Pita Bromelia'* (which see), probably indicated *Karatas Plumieri*, E Morren: for fuller references see the preceding
98	"Some of the species of fibres that have been called Silk grass . . . are *Ananas sativa*, *Karatas Plumieri*, *Bromelia sylvestris*, *Furcræa Cubensis*, and other similar forms, while the name has even been applied to the fibre of some of the Agaves Its use, therefore, without the botanical name of the species can only add to the confusion which already exists"
94, 95, 98, 128	Sir Daniel Morris thinks that *Furcraea cubensis* may also be a source of silk grass fibre in Yucatan (cf. *Sisal Hemp* and *Cajun*)
Do	See *Grass Silk*, etc
94, 95	Cf *Seemay Kathalay* above
94, 95	Probably Mauritius Hemp, wrongly identified with Agave (E) in consequence of Haworth's having transferred Roxburgh's plant from *Agave* to *Furcraea*, erroneously
Do	As the fibre is said to be very long, fine, and white, and the English name is given as 'Green aloe,' the fibre was no doubt Mauritius Hemp, and from a *Furcraea* See *Green Aloes* also.
	Cf. *Kattalai*, &c, and see also *Kattalay*
	A port on the coast of Yucatan, formerly the chief outlet for the fibre of the Merida district. The export trade is said to have now shifted to Progreso.

Name	Authority	Language	Where used	Scientific determination
Sisal Hemp	Martius (Beitrag etc p. 89), also Kew Sel Papers (Addl. Ser II) XLII and XLIX	English	Cosmopolitan	Agave longifolia, Engelmann Agave sisalana, Perrine, etc
Small Aloe	Ainslie Mat Med (1826) ii—169	English	S India	*Aloe littoralis* Koenig

Page	Remarks
146, also 89, 143, 147	The fibre long exported from the coast of Yucatan was mainly belt of Mexico Other fibres seem to have been exported also, on their own merits, or mixed with the fibre of the *Sacqui*, which is still grown in plantations on a large scale One may have been from a *Furcraea* and another is called 'Istle' but whether this 'Istle' was the same as the *Pita Bromelia* or *Silk Grass* of Honduras is uncertain, through mixing of the fibres, or confusion over local names Yucatan fibre has been called 'Silk grass' and 'Istle,' and a *Euagave* has been named '*Agave Ixtli*' on the assumption that it is the source of Yucatan Istle fibre' In 1838 Dr Perrine, of Engelm *not* know *Yashqui* is doubtfu except in cultivation Both 'Yashqui' (*A sisalana*, Perrine) and 'Sacqui' (*A longifolia*, Engelmann) are grown in Yucatan, but *A sisalana*, Perrine is the plant that has been introduced in India, and in the Bahamas '*Bahamas Hemp*' has been attributed to '*Agave rigida* var *elongata*', on the supposition apparently that the *Sacqui* had been so described by Engelmann, it is true that Engelmann supposed that the *Sacqui* might be 'A elongata' of Jacobi, but his own name for '*Sacqui*' was var *longifolia*.' We distinguish these plants thus: *Sacqui*, *i e*, the chief 'Sisal' of Yucatan = A *longifolia*, Engelmann, *Yashqui*, *i e*, the Bahamas Hemp, and E. Indian 'Sisal' = *A. sisalana*, Perrine See also *Henequen* (3), etc As compared with *Agave* and *Furcraea* species called '*Large Aloe*' or '*Great Aloe*' See *Small Aloe*, and *Seaside Aloe* also.

NAME	Authority	Languag	Where used	Scientific determination
TABAGO SILK GRASS	Dodge	English	America	*Furcraea cubensis*
TACORI	J Bauhin and Sloane	[Tupi fi lian]	S America	*Aloe Yuccae folis* (Sloane)
TALE NARU	Liotard	Canarese	S India (Mysore)	*Pandanus odoratissimus*
TAPEMETE	Rose	Mexican	Central America (Mexico)	*Agave vivipara*
TAMPICO				
TAMPICO FIBRE	Rose	English	America	*Agave* spp
TEQUILA (1)	Rose (and others)	Spanish	Central America (Mexico)	*Agave* sp

Page	Remarks
94, 95	Cf *Silk Grass* (3) and (4) and *Nequametl* (2) Also spelled 'Tobago De Laet's drawing of the plant he called *Nequametl* (which see) was made in Tabago
	The older writers seem to have connected this in some way with the *Agaveae*, but it was doubtless the *Tagoara* fibre now ascribed to *Guadua Tagoara* Kunth (of the Bamboo family).
.	'Tale' is properly a palm, but often applied to species of *Pandanus* in S India
	Mr Rose is referring doubtless to *Agave vivipara*, Baker, of which the description answers *A vivipara* of Wight, i e (J) of this Bulletin He observed it in Jalisco and Zacatecas on the sides of hot ravines, where thread is got from it for household uses So far as we can judge from his description, the 'Tapemete' is not the plant called *A vivipara* by Buchanan, and figured by Wight though it may be very near it It is probably the *Tepemexcalli* of Hernandez
	A port bordering on the State of Vera Cruz (in the Mexican Republic) from which fibre collected in *Tula, Zacatecas* and other upland tracts is exported for brush making
	This has often been regarded as co extensive with 'Istle' and obtained in great part from '*Agave heteracantha*' but there is considerable doubt as to what '*Agave hetera*... is now ... to the ... Mexico ... princip... parts o... British ... an Agave at all Also sometimes called 'Tampico Hemp' (unless this is really something quite different)
98	A liquor (spirit) made from the sap of an *Agave*, chiefly in the States lying westwards from the capital (*Jalisco* etc) Mr Rose says that the leaf is very narrow, and that it may be the same as *Huila* (which see), but in any case is not *A americana* If *Huila* be the same then it yields fibre also.

NAME	Authority	Language	Where used	Scientific determination
TEQUILA (2)	Nelson	Mexican	Central America (Mexico)	Agave sp.
THALAY NAR	Mad Exh Cat 1857	Canarese	S India (Madura)	*Pandanus odoratissimus*
THEMBU NANUT	Liotard	Burmese	Burma (Mergui)	*Agave americana*
THEOMETEL	Hernandez	Aztec	Central America (Mexico)	Agave sp
TOCCON	J Bauhin	Brazilian	S America	.
TOL	Martius	French	Antilles	*Furcræa cubensis*
TOUCON	Lery (in Sloane)	Do	Do	*Aloe Yuccae folius*
TOW	..	...	...	...
TRAP TREE	Martius	English	Malaya (Singapore)	*Artocarpus* sp

Page	Remarks
	clud- ... in ... *ula*) ... when ... alana ... (F), ... If, ... India ... then possibly F = '*A mexicana*' of Gamble (and probably T Moore), may be = *Tequila*; J = *A Wightii* of this Bulletin (*A vivipara* of Wight) = Bastard Tequila, E = *A Cantala Roxb* = *A vivipara* of Rose of which the description is not that of Wight's '*vivipara*,' but would fit our (E) or Baker's *A laxa* See the preceding, also *Bastard Tequila*, and *Huila*
.	Cf *Tale Nar* Spelled *Thaulau Nar* also Pandanus is often spoken of as a fibre plant but the commonest use seems to be by cutting strips from the leaf for mat making, etc, rather than by extraction of the actual fibre
96	Nanut = Pine apple?
	See *Toucon*.
...	See *Bois de Meche*, etc.
...	S
...	Short curled or interlaced fibres, from certain *Agaveæ*, *Yuccas*, and *Bromeliceae*, as distinguished from the long staple of the best species of *Furcraea* and *Euagave* (*Sansevieria* also)
...	Cf. *Kantal* or *Kathal* This is probably not the Jack fruit however, ... lley (Flora ... th weaving ... an *Agave*

NAME	Authority	Language	Where used	Scientific determination
VENETIAN WHISK	Kew Sel Papers (Addl. Series II) LXXIX and LXXX	English	Europe, etc.	*Chrysopogon Gryllus*
VERA CRUZ	..		..	..
VERA CRUZ ALOE	Moon (Ceylon Catalogue)	English	Ceylon	Agave Vera Cruz, Mill.
WHITE FIBRE		English	England, India etc.	Agave and Furcræa also Bromeliaceæ
WILAYATI ANANAS	.	...	...	..
WILAYATI KANTALA	Stewart, (Punjab Plants, p. 232)	Hindustani	N W India (Punjab)	*Agave Americana* L.
WILD ALOE	Liotard	English	Beluchistan	Nannorhops Ritchieana, H Wendl.
WILD ALOE FIBRE	Mad. Exh Cat, 1857	Do.	S India (Bellary)	*Agave* sp
WILD ALOES	Mad Exh. Cat., 1855	Do.	S. India (Coimbatore)	Do.

Page	Remarks
	See *Broom root, Brush fibre* (1 and 2), *Mexican Whisk*, etc.
...	A town and harbour on the Gulf of Mexico (State of Vera Cruz), which was and still is the chief seaport of the central parts of Mexico It lies in the warm coast strip below the plateaux and the ... way largely ... to the Vera ... en very near it
181	Agave (D) most likely We have seen no Ceylon specimens The name has often been used in Europe also, but it is not always easy *to say which species may have been intended The true plant was* ...
...	[illegible]
...	See *Bilati ananas*
95	This was doubtless on the supposition that Agave (J), which is self- ...
...	See also *Pesh* and *Aloe*
96	No doubt (J) or (D) Sent in 1855 from *Nellore* without clue t...
Do	Ditto Ditto Ditto.

Name	Authority	Language	Where used	Scientific determination
Yashqui	Engelmann	Maya Indian	Central America (Yucatan)	Agave sisalana, Perrine
Yaxche	Dodge	Aztec	Central America (Mexico)	*Bombax ceiba*
Yaxci	Miss Gdn Rept 1896	Maya Indian	Central America (Yucatan)	Agave sisalana, Perrine
Yanuga Calabunda fibre	Mad Exh. cat., 1857	Telegu	S. India (Kurnool)	*Aloe perfoliata*
Yenuga Kalabanda	Govt Botanist Madras	Do	S India (Guntur, Kurnool, Nellore)	Agave Vera Cruz. Mill.
Yenuga Kalabonda	Do.	Do	S India (Cuddapah)	Ditto
Yenuga Kalamanda	J. A C Boswell (Nellore Manual)	Do.	S India (Nellore)	Agave sp
Yetle	Miss Gdn Rept. 1896	Mexican	Central America (Arizona Texas and southwards)	*Agave Lechuguilla*, Torrey and allied species
Yugay	Mad. Exh. cat. 1855	Canarese?	S India (*Mysore*)	*Aristolochia indica*
Yuccada fibre	Mad. Exh Cat. 1857	Aztec	Central India	...

Page	Remarks
	Agave (G) See *Sisal hemp.* Spelled by Martius *Yaxqui*, and by others *Yaxci*, *Yaxqui* &c.
	A cotton tree: the down from the capsules is used for stuffing pillows &c.
...	See *Yashqui*.
...	Cf. the following.
...	Cf. the following and the preceding, also *Easugakalalanda*, etc
	Ditto ditto ditto
.	Probably Agave (D) as above.
	Cf *Istle*, &c
..	This is given as 'Yucay, white' and is followed by 'Yuccay red' [illegible] er There is evidently [illegible] *'olochias* are known to [illegible] *Yokada*, &c, are names [illegible] See the next also.
..	'*Yuccada fibre*' sent from Hyderabad was placed among 'unclassified barks' in 1857, but '*Yuccada Naru*' from Bangalore was referred to *Yucca gloriosa* *Iakkada Naru* is given in the Mysore list of paper fibres (in Liotard '*Yekkada naru*') True *Yucca* and *Agave* have been a good deal confused in S. India.

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YAXCI	Miss Gdn Rept 1896	Maya Indian	Central America (Yucatan)	Agave SISALANA, Perrine
YANUGA CALABUNDA FIBRE	Mad Exh cat, 1857	Telegu	S India (Kurnool)	*Aloe perfoliata*
YENUGA KATABANDA	Govt Botanist Madras	Do	S India (Guntur, Kurnool, Nellore)	Agave Vera Cruz Mill
YENUGA KALABONDA	Do	Do	S India (Cuddapah)	Ditto
YENUGA KALAMANDA	J A C Boswell (Nellore Manual)	Do	S India (Nellore)	Agave sp
YETLE	Miss Gdn Rept 1896	Mexican	Central America (Arizona Texas and southwards)	*Agave Lechuguilla* Torrey and allied species
YUCAY	Mad Exh cat. 1855	Canarese?	S India (Mysore)	*Aristolochia indica*
YUCCADA FIBRE	Mad Exh Cat 1857	Aztec	Central India	..

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	Probably Agave (D) as above
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	This is given as 'Yucay, white' and is followed by 'Yuccay red' without any clue to the origin of the latter There is evidently some mistake None of the Indian *Aristolochias* are known to have yielded fibre, while *Yekka*, *Yekkada*, *Yokada* &c, are names of the well known '*Yercum*' (a *Calotropis*) See the next also.
..	'*Yuccada fibre*' sent from Hyderabad was placed among 'unclassified barks' in 1857, but '*Yuccada Naru*' from Bangalore was referred to *Yucca gloriosa* *Yakkada Naru* is given in the Mysore list of paper fibres (in Liotard '*Yekkada naru*') True *Yucca* and *Agave* have been a good deal confused in S. India.

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YENUGA KALAMANDA	J A C Boswell (Nellore Manual)	Do	S India (Nellore)	Agave sp
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YUCAY	Mad Exh cat. 1855	Canarese?	S India (Mysore)	*Aristolochia indica*
YUCCADA FIBRE	Mad Exh Cat 1857	Aztec	Central India	..

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